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Better Feeling Rules Market

Recent Lapse of Confidence Appears To Be Checked—New Buying Limited but Prospects of Renewed Activity Better as Consumption Keeps at High Speed—Steel Prices More Stabilized and Range Is Narrowed

A BETTER feeling has characterized the iron and steel market during the past week and the recent tendency shown by both buyers and sellers toward uncertainty and distrust appears to have been definitely arrested. While inquiry has been better in spots, conservative policies of buying still are strongly in effect and new business is held to a very limited volume. The view is generally held, however, that with improved sentiment, a resumption of new commitments on a substantial scale may be expected before many weeks since consumption, from all tests, is being maintained at high speed. Iron and steel production remains at a top gait.

Some signs of the expected seasonal letup in the automobile industry relate more to parts demand than to finished cars in which production is maintained at a record rate. Last half production schedules of some builders call for two-thirds of the first half total.

Settlement of the year's working agreement between the mills and the Amalgamated association will give the tin mill and tin house workers an advance of 10 to 11 per cent. The sheet scale is unchanged. The conference between the representatives of the bar iron mills and the men now is in progress.

Prices More Stable

Steel prices make a show of greater stability. One of the independent mills which recently sold a tonnage of black sheets $2 under the Steel corporation schedule, has restored the latter level. Some reports of occasional shading in hoops and bands are coming out. For third quarter cold-rolled strip steel now is quoted unchanged by the manufacturers. Premiums continue to come off the early plate and structural shape market. Eastern makers now are naming 2.75c mill on plates and 2.60c to 2.65c mill on shapes. One independent mill is offering early steel bars at 2.50c Pittsburgh or $2 above the forward market, and this producer or some other sold 2000 tons in Chicago territory for June delivery at 2.50c to 2.55c Pittsburgh.

Softness in pig iron has forced another slight recession to $47.26 in the single market composite of IRON TRADE REVIEW covering fourteen leading iron and steel products. The decline in the past three weeks is 44 cents per ton.

Building Is Checked

The smallest total in structural steel awards since last September is reported this week. It is only 7442 tons. Building labor troubles at New York, Pittsburgh and elsewhere constitute a retarding factor. More new undertakings have come up for bids, however, than in recent weeks and total 14,000 tons.

The New York Central railroad has taken bids on 175,000 tons of rails representing its entire last half's requirements. The Pennsylvania and the Reading have practically decided to buy 15,000 tons each of rails for last half. A few more small lots of rails for 1924 delivery have been placed by western roads. Car orders are few apparently because the shops cannot promise deliveries until late in the year. To keep up to the average at least 80,000 cars should be placed the balance of the year.

April iron and steel exports have shown a further substantial gain, reaching 183,509 tons. This is the largest monthly total since June, 1922.

More tonnage of furnace coke for third quarter has been sold at a slightly weakened price. One contract for 10,000 tons monthly went at $5.85 ovens and $5.75 has been quoted since on a requirement of equal size. Renewed inquiry for about 8000 tons of American coke from Europe has not resulted in sales although quotations are $2.50 less.

More Inquiry for Iron

As consumption runs ahead heavily, buyers in a slight way are showing more interest in third quarter pig iron. An inquiry for 4000 tons of foundry iron from a Michigan automobile foundry is one of the first requests for that period to appear. Cast iron pipe makers were recent buyers of 20,000 tons of southern iron. Steel-making grades at Pittsburgh have settled further with several makers desirous of selling. The true market level is obscured, however, by the availability of some lots of resale iron at special concessions. Otherwise the general price situation in pig iron has developed no new soft spots.

Business Trend and Chart Section Page 1587

More Interest Shown in Pig Iron

Buyers Beginning To Give More Thought to Third Quarter Requirements—4000-Ton Inquiry Appears—Steelmaking Grades Offered Lower by Makers at Pittsburgh—Resale Lots Figure at Special Concessions

PITTSBURGH, May 29.—Weakness continues to characterize the pig iron market as users maintain their policy of withholding their orders. Basic iron is obtainable from producers at $28, valley, with prices on resale iron of 25 and 50 cents per ton under that available. One sale of resale basic at the $27.50, valley, basis involves 5000 tons or more while another at $27.75, f.o.b. furnace calls for 2500 tons, both being made to a Butler, Pa. consumer. Producers, however, are quoting $28, valley, on an inquiry for 1500 tons now current, which price IRON TRADE REVIEW considers the real market. Practically the same condition applies to bessemer iron with resale iron available at $29 and lower, while the producers' market is quotable at $29.50, valley. Only small lot sales are moving and no large tonnages are being asked for in either bessemer or basic grades. The market on malleable is quoted at $29 to $29.50, valley, while on gray forge, $28 to $28.50 is fairly representative although no sales lately have been registered to clarify the gray forge situation. This price is based on the market quotations of No. 2 foundry. Producers are selling single carloads of No. 2 (1.75 to 2.25 silicon) at $29.50 and $30, furnace, or valley basis, and one or two maintain a differential of 50 cents to $1 under that for gray forge. One furnace is quoting $29 to $30, f.o.b. Pennsylvania furnace, which has a freight rate of $1.63 to Pittsburgh common points or 14 cents below the rate from valley furnaces. Consumers of foundry as well as other grades of iron are apparently of one mind in deferring third quarter contracts until later, possibly the middle of June. They believe the market will recede still further and many expect to close at $28, valley. Firm offers of 5000 to 10,000 tons at a time at $28 would doubtless be accepted by producers today. Only small demands are noted, particularly for low phosphorus, copper-free iron, which remains quotable at $35, valley.

New England Inquiry Improves

Boston, May 29.—Eastern furnaces feel encouraged over the recent improvement in inquiry. Sales in New England continue in small volume, but an improved tone is apparent everywhere in the market. Foundries asking for iron for June delivery have had to pay a premium above the low third quarter quotations which are being quoted. Eastern Pennsylvania furnaces almost without exception are holding fast to the high level of $31, furnace, despite the fact that they are booking almost no tonnage in New England at this price. One Virginia furnace which has recently been the low seller is now temporarily out of the market. These are some of the encouraging features. In opposition are the continued low selling by some furnaces and the appearance of small tonnages of resale iron. The prevailing base prices are as follows: $29, Buffalo, which means $33.92, delivered New England; $31, eastern Pennsylvania, or $34.65 delivered; $28 Virginia, or $33.92 delivered; $27 Birmingham, or $36.60 for rail delivery. Sales of the past week include 800 tons to a Connecticut consumer, 150 tons to a Vermont consumer, and several 200 and 300 ton lots in Massachusetts. A Connecticut consumer is in the market for 400 tons, a Rhode Island foundry for 200 tons, and miscellaneous informal inquiry is widespread. Nearly all Boston dealers report a greater readiness to buy on the part of New England foundries generally.

Iron Trade Review Composite Market Average 1913 to date, page 1638

Prices Show Some Spread

Buffalo, May 29.—Most sellers are maintaining the $29.50 price and are selling a limited amount on this basis with $30 for No. 2X, (2.25 to 2.75 silicon) and $30.50 for No. 1X (2.75 to 3.25 silicon). The $29 price has been quoted and transactions have taken place on this basis but most producers feel that the demand is so light, as to make shading of little practical profit. Malleable is being quoted at $30. Inquiry is about 2000 tons in the aggregate, with sales in about the same ratio. Occasional shading of the silicon differentials is being done but not as a rule.

Market Shows More Life

Cincinnati, May 29.—Demands for third quarter pig iron are appearing in larger volume and fair sales for that delivery have been made during the week. A good demand prevails for prompt iron. The bulk of the inquiry for third quarter is coming from those districts that figured early and heavily in the buying movement for second quarter. From the standpoint of business volume the past week was better than any other period during the past two months. The market displays a stronger tone than for several months and prices are decidedly firm. The southern market is strong and sales have been made at prices ranging from $27 to $28, Birmingham base, while northern iron is quoted at $31 to $32, Ironton base. Sales during the past week include 500 tons of northern iron to the Standard Sanitary Mfg. Co., for its Louisville, Ky. plant. The Muncie Malleable Foundry Co., Muncie, Ind., bought 1000 tons of malleable for third quarter, while the Hercules Corp. closed for 400 tons of southern iron at $27, Birmingham base, for its gas engine works at Evansville, Ind. Sellers report that there is a large demand for northern iron for June shipment. A number of sales involving 50 to 100 tons of southern and northern iron were made. The International Harvester Co., is in the market for 500 tons of northern and 250 tons of malleable for its plant at Springfield, O. The inquiry calls for June shipment, and specifies that 50 per cent of the tonnage must be delivered at the plant by June 15. Leading melters in this district have booked an excellent volume of business which in some cases will occupy plant capacity for the next 90 day. Reserve stocks of iron and other raw materials in general are at the lowest point of the season.

Believe Buying Is Near

St. Louis, May 28.—The pig iron market is quiet, though there are indications that a buying movement is not far distant. One is the heavy melt and the fact that users are pressing for shipments. Melters are quietly seeking definite information on third quarter supplies. While the total melt of pig iron in this district in April was 10 to 12 per cent under that of March, still it was very large. Operations since May 1 are at about the same rate as through April. Virtually all melters have orders booked which will assure them a good third quarter business. The slowing down in orders has not been accute, and is nowhere looked upon as anything but a temporary lull. Advices from the South indicate that iron producers there are very hopeful. Several additional stacks have been blown in. Furnace interests are not pressing sales. Quotations on southern iron range from $27 to $28, but tonnages at $27 are considerably freer than two weeks ago. The St. Louis stove plants continue active, operating at about 80 per cent capacity. Jobbing foundries have slowed down slightly. Spot sales of iron reported total only 10 cars. The inquiry for 1000 tons of foundry from a Wichita, Kans., melter has not been filled. A Peoria melter is inquiring for 500 tons of foundry iron and a melter in the St. Louis district wants 400 tons.

Improvement in Inquiry

New York, May 29.—Sales of pig iron comprised a very small total during the past week. There is some improvement in inquiry and a notable feature is the amount of malleable that is involved. The total inquiry now before the trade is 3000 to 4000 tons, of which half is for malleable. One inquiry is for 200 tons of bessemer. Most of this iron is wanted for fairly early shipment. The third quarter buying movement as yet has shown no signs of getting started. Prices are practically unchanged. Some central Pennsylvania foundry has been sold at $28, base furnace. While asking prices on Virginia foundry iron are unchanged, there is a disposition to accept firm bids involving concessions. Small lots of Virginia foundry have been sold as low as $28,

furnace, for the 2.25 to 2.75 silicon grade. On eastern Pennsylvania and New Jersey foundry iron, as far as known, there has been no concession from the level of $31, base furnace, plus $1 silicon differentials.

Orders for Small Lots

Birmingham, Ala., May 28.—Southern furnaces are receiving some new business in pig iron, practically all in small lots and quotations show no weakening with $27 base being named. Some of the smaller furnace interests announce orders on hand will last at least until Oct. 1 while larger producers assert that the expected third quarter output has been well covered. Inquiries are slow.

Labor supplies at furnaces, mills and foundries in the Birmingham district continue short. Much of the labor working in ore mines and in coal mines has left for northern plants. The labor situation, therefore, is far from being easy in this district.

More Activity at Chicago

Chicago, May 29.—Quickening inquiry for pig iron is noted for the third quarter, though it is not yet general. Buyers show more interest and there is more activity than at any time in the past six or eight weeks. Practically no resale iron is offered in this market and all is absorbed quickly. Melters press for deliveries, but some southern iron is far behind. Inquiry is for 500 to 1000-ton lots. Sales include 200 to 500 tons. Silveries and low phosphorus iron are dull. A western producer is now making the latter grade. Low phosphorus iron is quoted $37 to $38, Chicago.

Sellers More Cheerful

Cleveland, May 29.—A more cheerful view of the outlook in the pig iron market is taken this week by sellers, and confidence is expressed that buying for the third quarter will be underway in larger volume within 10 days or two weeks. This expectation is based on records of consumption, and the fact that melters are urging large shipments on contracts, using their material as fast as they receive it. All makers report good shipping instructions. Sales are light, one lake furnace having booked around 1000 tons in the week in small lots. One of the northern Ohio furnace interests closed for around 400 tons of foundry iron on a basis of $29.50, Buffalo, though Buffalo sellers have been offering iron in this territory at $29, furnace, the equivalent of $31.65, delivered. Iron also has been offered at $29.50, valley furnace, which would bring the price, delivered in Cleveland to $31.27. The largest inquiry received here in some weeks is that from a Port Huron, Mich., maker of automobile castings, for 3000 to 4000 tons of iron for the third quarter.

Better Inquiry In East

Philadelphia, May 29.—Pig iron inquiry has increased somewhat, but only small lots are involved and the aggregate in this district probably does not exceed 1000 tons. There is an optimistic feeling in view of the fact considerable third quarter buying must be done. Nevertheless the delay in getting the movement started is causing some tension, particularly because furnaces have greatly reduced their unfilled order books during the recent buying lull. In view of the lack of a market best prices

Coke Is Slightly Weaker

Contract Market for Furnace Grade Now Quoted $5.75 to $6—Some Users Closing, Others Still Deferring Purchases

COKE PRICES, PAGE 1575

Pittsburgh, May 29.—One or two additional blast furnace contracts for beehive coke have been closed and the figures involved indicate a further weakening in the contract price. One lot approximating 10,000 tons monthly for the third quarter was booked at $5.85, and since then $5.75 has been quoted on another requirement of similar size. The E. & G. Brook eCo. closed for its coke needs amounting to about 12,000 tons monthly at around $6, ovens, which figure still is maintained as a quotation in certain directions. Various blast furnace operators believe the coke market still to be in a state of flux and therefore they are withholding the placing of their contracts. A few like the Carbon Furnace Co. seek June tonnages only and some continue to buy lots of five to twenty carloads at a time as they become available. The $4.50 price has not been duplicated recently in the spot market and the majority of dealers are at $5, although on some spot lots $5.25 and as high as $5.50 has been secured. Some run-of-oven as well as some high-sulphur coke has been selling at below $4.50 in small lots. A few operators like the Shenango Furnace Co. and the Struthers Furnace Co. having closed on a portion of their requirements at $6, as indicated a week ago, are withholding action on the remainder. One report, however, so far unconfirmed, is that the Struthers Furnace Co. closed on the remainder of its coke needs at below the $6 price. Some interests like the Bethlehem Steel Co. have said they will buy their third quarter coke at $5.50, but so far no quotations for the quarter have developed that low. The spot market is quoted at $5 to $5.50, while the contract market is $5.75 to $6, the minimum of the latter being 25 cents under the contract price one week ago. Foundry coke is unchanged both as regards price and demand. Quotations vary from $5.50 to $6.50 and demand is limited. Production, according to the *Connellsville Courier*, for the week ended May 19 was 298,430 tons as compared with 297,720 tons the preceding week.

Beehive Sales Improve

Boston, May 29.—The gradual increase in sales of beehive coke in New England seems to point to a lower by-product price before June. Good grades of Connellsville foundry coke are offered the New England trade at from $13 to $13.50, delivered, whereas the two local by-product producers are quoting $15 delivered. Foundry demand for shipments continues fair.

Spot Demand Is Smaller

New York, May 29.—Demand for spot coke is of a scattered character and is smaller in the aggregate than recently. The market on spot standard foundry coke now may be quoted at $6 to $6.50, Connellsville, with special brands in some instances still bringing as high as $7.25. Beehive producers in some instances during the past week have named prices ranging from $7.50 to $8, Connellsville, on second half foundry coke contracts, but only one sale was made. In fact, there is very little demand for second half coke at this time. The Seaboard By-Products Coke Co. continues to quote $12.34 to $12.41, delivered at Newark and other New Jersey points, for by-product foundry coke.

Cincinnati Market More Active

Cincinnati, May 29.—Increased activity among foundries in this district has created a better demand for coke. Reports of curtailment in production in the Connellsville district also have tended to strengthen the market. Word has been received here that a Connellsville producer operating 35 ovens will cease production June 1, because of prevailing market prices. While actual sales are confined to small lots for prompt shipment, inquiry for future delivery is larger than for several weeks. Wise county coke is stronger, although some shading is being done. Producers in the Connellsville district are unwilling to quote on third quarter business at prevailing prices, However, they will accept orders for June shipment at current schedules. The most important sale of the week was 200 tons of New River coke to a St. Louis user for third quarter. A central Ohio user is in the market for 90 tons of foundry coke a month for the next six months. Another consumer in that district is negotiating for six cars of foundry fuel a month for last half.

St. Louis Market Steady

St. Louis, May 29.—Contracting for coke by dealers and industrial users continues active, prices for all grades holding firm. The demand for furnace and foundry grades is slightly less active than earlier in the month, most of the melters having all they need for the present. Fair sales to smelters in the tri-state district have taken place since May 1, and water and gas interests have been buying. An Iowa public utility company purchased 25,000 tons from a local by-product maker. Prices on all grades and sizes hold steady.

Southern Market Quiet

Birmingham, Ala., May 28.—While the coke market is quieter than it has been for several months, considerable tonnage is yet to be delivered on contract. No reflection is noted in prices, $8.50 being stated as the minimum on contract, with $9 and $9.50 representing the average selling price in the foundry coke market. Operations are steady, by-product plants going, and many of the beehive ovens producing coke.

The Pullman Co., Chicago, has taken orders for about $9,000,000 worth of new business since Jan. 1, officials of the company report. Prospective orders now in sight amount to about $40,000,000. Carry-over from 1922 was about $12,000,000.

More Interest in Pig Iron

(*Concluded from Page 1573*)

continue to be named, but they are largely nominal. The feeling prevails in some quarters that when third quarter buying starts it will develop somewhat lower prices. There are no developments in basic iron. A moderate lot of copper-bearing low phosphorus iron was sold at $33, furnace. There is some talk about eastern plate mills needing considerable basic iron, but no inquiry as yet has come out.

Demand Continues Active

Seattle, May 26.—This market remains unchanged. Demand continues active and the turnover shows gains over the same period last year. Not much new business has been placed this month as buyers are well stocked up for several months. Importations of British and Scotch pig iron are arriving constantly and orders are booked for delivery until September or October. Firmness of the market resulted in heavy buying during the last 60 days. Prices are unchanged No. 1 Glengarnock being quoted at about $40 delivered, duty paid.

Motor Merger Approved

Stockholders of the Haynes Automobile Co. have approved a consolidation of its properties with those of the Winton Automobile Co., of Cleveland and the Dorris Motor Car Co., of St. Louis. The new company will be known as the Consolidated Motors Corp. and will be capitalized at $19,000,000 under the laws of Delaware. The principal plant and offices of the new company will be located at Kokomo, Ind.

Iron Production in Canada Continues to Gain

Toronto, Ont., May 28.—Canadian pig iron production during April was 83,877 long tons, this being the greatest output since November, 1920, when 93,925 tons was made. The April production was 28.5 per cent greater than that for March, which totaled 65,297 tons. The production for the first four months of the present year is 67.2 per cent greater than for the corresponding period in 1922, and 18.1 per cent greater than that for the same period in 1921. Compared with figures for March the output reported for the further use of companies reporting declined slightly, while the requirements for sale increased from 8833 tons in March to 30,899 tons in April. The basic and malleable grades for sale showed slight advances, but the greatest increase was reported in foundry iron, which increased from 4603 tons in March to 22,839 tons in April. The production of ferroalloys also showed slight increase from 2213 tons in March to 2258 tons in April. Early in April two additional furnaces were blown in and nine furnaces were in blast before the close of the month.

Production of steel ingots and castings made a further advance in April when 92,598 long tons were produced, representing an increase of 3510 tons or 3.9 per cent over that of the previous month. The output for April was greater than that for any month since November, 1920, when 97,120 tons was reported. The cumulative production of steel ingots and castings for the first four months of the present year was 276,184 tons as compared with 176,036 tons in 1922 and 127,036 tons in 1921 for the first four months of these years, the cumulative production for the first four months of 1920 amounted to 365,678 tons. The production of steel ingots for the further use of companies increased from 85,393 tons in March to 88,649 tons in April. Direct steel castings increased to 3949 tons in April, compared with 3695 tons in March.

Plant Begins Operations

The first heat made since the disastrous fire at the plant of the Victor Stove Co. Salem, O. on March 8, was reported May 24 by Charles Sweeney, general manager. The second heat was made May 26 and it is expected that the moulders will be able to continue work regularly from this time on. Because of numerous orders, prospects for a good year are bright. During the process of rebuilding the burned plant many improvements were inaugurated.

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	May 29, 1923	April 1923	Feb. 1923	May 1922
PIG IRON				
Bessemer, valley, del., Pitts.	$31.27	32.77	29.57	26.46
Basic, valley	28.00	31.00	26.10	24.50
*No. 2 foundry, del. Pittsburgh	30.77	32.77	28.77	25.71
*No. 2 foundry, Chicago	32.00	32.50	29.75	20.00
Lake Superior charcoal, Chicago	36.65	36.55	33.55	26.90
Malleable, valley	29.00	31.00	27.25	24.50
Malleable, Chicago	32.00	32.50	29.75	20.00
*Southern No. 2, Birmingham	27.00	27.00	24.50	17.60
*Southern Ohio, No. 2, Ironton	31.00	31.00	28.40	22.70
Basic eastern del., eastern Pa.	30.75	30.75	28.15	24.55
**No. 2X, Virginia furnace	28.50	29.25	27.50	23.50
**No. 2X, eastern del., Phila.	32.76	32.76	30.10	25.60
Gray forge val. del. Pittsburgh	30.27	31.77	27.87	25.46
Ferromanganese, del. Pitts.	124.79	124.79	112.79	72.32
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh	45.00	45.85	39.25	35.00
Sheet bars, open-hearth, Pitts.	45.00	45.85	39.25	35.00
Billets, bessemer, Pittsburgh	45.00	46.00	38.85	34.50
Billets, open-hearth, Pittsburgh	45.00	46.00	38.50	34.50
FINISHED MATERIAL				
Steel bars, Pittsburgh	2.40	2.35	2.15	1.60
Steel bars, Chicago	2.50	2.43	2.21	1.56
Steel bars, Philadelphia	2.77	2.825	2.525	1.96

	May 29, 1923	April 1923	Feb. 1923	May 1922
FINISHED MATERIAL (Continued)				
Iron bars, Philadelphia	$2.82	2.875	2.45	1.96
Iron bars, Chicago mills	2.60	2.60	2.46	1.58
Beams, Pittsburgh	2.50	2.45	2.15	1.60
Beams, Philadelphia	2.82	2.85	2.525	1.96
Beams, Chicago	2.60	2.53	2.31	1.58
Tank plates, Pittsburgh	2.50	2.45	2.15	1.60
Tank plates, Philadelphia	2.92	2.95	2.525	1.96
Tank plates, Chicago	2.60	2.53	2.31	1.58
Sheets, blk., No. 28, Pittsburgh	3.85	3.85	3.35	3.15
Sheets, blue anl., No. 10, Pitts.	3.00	3.15	2.50	2.40
Sheets, galv., No. 28, Pittsburgh	5.00	5.00	4.35	4.15
Wire nails, Pittsburgh	3.00	3.00	2.75	2.40
COKE				
Connellsville furnace, ovens	5.00	6.25	7.20	6.00
Connellsville foundry, ovens	5.50	7.80	8.60	6.50
OLD MATERIAL				
Heavy melting steel, Pittsburgh	21.50	25.85	23.40	17.00
Heavy melting steel, eastern Pa.	19.50	23.50	21.20	15.15
Heavy melting steel, Chicago	18.50	22.40	19.75	12.05
No. 1 wrought, eastern Pa.	23.50	27.00	24.10	17.00
No. 1 wrought, Chicago	18.50	22.75	20.50	12.25
Rails for rolling, Chicago	21.00	23.65	22.00	12.85

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon

Composite Market Average

Composite Market Record by months for Nine Years on Page 1348

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products, Yesterday, One Week, One Month, Three Months, One Year and Ten Years Ago

May 29, 1923	May 23, 1923	April, 1923	February, 1923	May, 1922	May, 1913
$47.26	$47.44	$47.01	$42.61	$36.49	$27.34

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

Iron and Steel Prices

SCRAP PRICES, PAGE 1640, WAREHOUSE PAGE 1632, ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 1636

Composite Market Record by months for Nine Years on Page 1638

Pig Iron

Bessemer, valley	$29.50
Bessemer, Pittsburgh	31.27
Basic, valley	28.00
Basic, Pittsburgh	29.77
Basic, Buffalo	29.50
Basic, del., eastern Pa.	30.50 to 31.00
Malleable, valley	29.00 to 29.50
Malleable, Pittsburgh	30.77 to 31.27
Malleable, Chicago	32.00
Mallebale, Buffalo	30.00
Malleable, del., eastern Pa.	33.00 to 33.50

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.23
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	34.01 to 34.26
No. 1X Buffalo	30.00 to 30.50
No. 2 foundry, valley	29.00 to 30.00
No. 2 foundry, Pittsburgh	30.77 to 31.77
No. 2 foundry, Buffalo	29.00 to 29.50
No. 2 foundry, Chicago	32.00
No. 2 foundry, Granite City	33.00 to 34.00
No. 2 foundry, Ironton fur.	31.00 to 32.00
No. 2 foundry, Cleveland del.	31.27 to 31.65
No. 2 foundry, del. Phila.	31.76 to 32.13
No. 2 foundry, N. J. tidewater	32.13 to 33.28
No. 2X, eastern del., Phila.	32.76 to 33.13
No. 2X, east. N. J., tidewater	33.13 to 33.78
No. 2X, eastern del. Boston	34.65 to 35.65
No. 2X foundry, Buffalo fur.	29.50 to 30.00
No. 2X, Buffalo, del. Boston	33.92 to 34.42
No. 2 southern, Birmingham	27.00
No. 2 southern, Cincinnati	31.05
No. 2 southern, Chicago	33.01
No. 2 southern, Philadelphia	33.80
No. 2 southern, Cleveland	33.01
No. 2 southern, Boston (rail and water)	33.41 to 33.91
No. 2 southern, St. Louis	32.17
No. 2X, Virginia furnace	28.00 to 29.00
No. 2X, Virginia, Phila.	33.27 to 34.27
No. 2X, Virginia, Jersey City	33.54 to 34.54
No. 2X, Virginia, Boston	34.92 to 35.42
Gray forge, eastern Pa.	29.00 to 30.50
Gray forge, val., del. Pitts.	30.27 to 30.77
Low phos., standard, valley	36.00
Low phos., standard, Phila.	35.75
Low phos., Lebanon furnace	33.00
Charcoal, Birmingham	34.00 to 35.00
Charcoal, Superior, Chicago	36.65

Silvery Iron

Jackson County Ohio, furnace

8 to 9 per cent	$39.50
9 to 10 per cent	41.50
10 to 11 per cent	43.50
11 to 12 per cent	46.50
12 per cent	48.50
13 per cent	51.00

Bessemer Ferrosilicon

Jackson County, Ohio, furnace

10 to 11 per cent	$48.50
11 to 12 per cent	51.80

Ferroalloys

Ferromanganese 78 to 82 per cent, domestic, seaboard or furnace	$120.00 to $125.00
Ferromanganese, delivered, Pittsburgh	124.79 to 129.79
†Ferromanganese, 79 per cent English c.i.f. seaboard	125.00
Spiegeleisen 19 to 21 per cent furnace or tidewater, contract	45.00 to 47.50
Spiegeleisen 19 to 21 per cent furnace or tidewater, spot	50.00
Ferrosilicon, 50 per cent contract freight allowed	95.00 to 97.50
Ferrotungsten standard, per pound contained	92.50 to 97.50
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon per pound contained, delivered	12.00
Imported ferrochrome, 4 to 6 per cent carbon	12.00

†Duty paid.

Ferrovanadium, 30 to 40 per cent per pound estimated, according ton analysis	$3.50 to $4.00
Ferro carbon-titanium, carloads, producers plant, per net ton	$200.00

Coke

Beehive, Ovens

Connellsville furnace	$4.00 to 6.00
Connellsville foundry	5.50 to 6.50
New River furnace	9.50 to 10.00
New River foundry	13.00 to 14.00
Wise county furnace	7.00 to 7.50
Wise county foundry	8.00 to 8.50
Alabama furnace	7.50 to 8.00
Alabama foundry	8.50 to 9.00

By-Product

Foundry, Newark, N. J., del.	$12.34 to $12.41
Foundry, Chicago, ovens	15.00
Foundry, Boston, delivered	16.00
Foundry, Granite City, Ill.	14.00
Foundry, Alabama	8.50 to 9.50

Semifinished Material

BILLETS AND BLOOMS

4 x 4-inch base

Open-hearth, Pittsburgh	$42.50 to 47.50
Open-hearth, Youngstown	42.50 to 47.50
Open-hearth, Philadelphia	48.17 to 50.17
Bessemer, Pittsburgh	42.50 to 47.50
Bessemer, Youngstown	42.50 to 47.50
Forging, Pittsburgh	55.00
Forging, Philadelphia	58.17 to 60.17

SHEET BARS

Open-hearth, Pittsburgh	$45.00 to 47.50
Open-hearth, Youngstown	45.00 to 47.50
Bessemer, Pittsburgh	45.00 to 47.50
Bessemer, Youngstown	45.00 to 47.50

SLABS

Pittsburgh	$42.50 to 47.50
Youngstown	42.50 to 47.50

WIRE RODS

¼-inch and finer

Wire rods, Pittsburgh	$51.00 to 55.00

SKELP

Grooved skelp, Pittsburgh	2.45c to 2.60c
Universal skelp, Pittsburgh	2.45c to 2.60c
Sheared skelp, Pittsburgh	2.45c to 2.60c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.50c to 2.60c
Structural shapes, Phila.	2.82c
Structural shapes, New York	2.84c
Structural shapes, Chicago	2.60c to 2.70c
Tank plates, Pittsburgh	2.50c to 2.60c
Tank plates, Philadelphia	2.82c to 2.97c
Tank plates, New York	2.84c to 2.99c
Tank plates, Chicago	2.60c to 2.80c
Bars, soft steel, Pittsburgh	2.40c to 2.50c
Bars, soft steel, Philadelphia	2.72c to 2.82c
Bars, soft steel, New York	2.74c to 2.84c
Bars, soft steel, Chicago	2.50c to 2.60c
Bars, refined iron, Pittsburgh	3.15c to 4.85c
Bars, rail steel, Chicago	2.30c to 2.40c
Reinforcing bars, Pittsburgh	2.40c to 2.50c
Bar iron, common, Phila.	2.82c
Bar iron, common, New York	2.84c
Bar iron, common, Chicago	2.60c to 2.75c
Bars, forging quality Pittsburgh	2.65c to 2.75c

Hoops, Bands, Shafting

Hoops, Pittsburgh, large	3.30c to 3.50c
Hoops, Pittsburgh, small	3.50c to 3.75c
Bands, Pittsburgh	3.30c to 3.50c
Cold finished steel bars, Pittsburgh base	3.25c
Steel shafting, Pittsburgh	3.25c
Cotton ties, bundle 45 lb. Pittsburgh	$1.90

Rails, Track Material

Standard bessemer rails, mill	$43.00
Relaying rails, St. Louis	30.00 to 39.00
Relaying rails, Pittsburgh	30.00 to 34.00
Light rails, 25 to 45, mill	2.25c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	3.15c
Spikes, small railroad, Pitts.	3.75c
Spikes, boat and barge, Pitts.	3.50c to 3.75c
Spikes, railroad, Chicago	3.25c
Track bolts, Pittsburgh	4.25c to 5.50c
Track bolts, Chicago	4.25c
Tie plates, Pittsburgh	2.60c to 2.75c
Tie plates, Chicago	2.60c

Spike, tie plate and track bolt prices for carlots.

Wire Products

To Jobbers in Carloads

Wire nails, Pittsburgh	3.00c to 3.10c
Plain wire, Pittsburgh	2.75c to 3.00c
Annealed wire, Pittsburgh	2.90c to 3.20c
Galvanized wire, No. 9 gage, Pittsburgh	3.35c to 3.60c
Barbed wire, painted, Pitts.	3.45c to 3.70c
Barber wire, galv., Pittsburgh	3.80c to 4.05c
Polished staples, Pittsburgh	3.45c to 3.65c
Galvanized staples, Pittsburgh	3.80c to 4.05c
Coated nails, count keg, Pitts.	2.70c to 2.75c
Woven wire fencing (retailers)	65 off
Woven wire fencing (jobbers)	67½ off

Chain, Piling, Strip Steel

Chain, 1-in. proof coil, Pitts.	6.50c
Sheet piling base, Pittsburgh	2.55c to 2.65c
Hot rolled strip steel, Pittsburgh stamping quality	3.30c to 3.50c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base	5.25c to 5.50c

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	3.85c
No. 28, bessemer, Pitts.	3.85c
No. 28, open-hearth, Phila.	4.17c
No. 28, open-hearth, Chicago	4.19c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	3.85c
No. 28, open-hearth, Chicago	3.84c to 4.34c

GALVANIZED

No. 28, open-hearth, Pitts.	5.00c to 5.25c
No. 28 bessemer, Pittsburgh	5.00c to 5.25c
No. 28, open-hearth, Phila.	5.32c
No. 28, open-hearth, Chicago	5.34c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.00c to 3.35c
No. 10, bessemer, Pittsburgh	3.00c to 3.35c
No. 10, open-hearth, Phila.	3.32c to 3.57c
No. 10, open-hearth, Chicago	3.34c

AUTOMOBILE SHEETS

No. 22 Pittsburgh	5.35c to 5.70c

Tin Plate

Per 100 lb. box

Tin plate, coke base, Pitts.	$5.50 to $6.00

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	61 to 62	49½ to 50½
1 to 1½-inch, butt iron	30	13

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3½ to 3¾-inch	35

Cast Iron Water Pipe

Class B Pipe

Four-inch, Chicago	61.20 to 63.20
Six-inch and over, Chicago	57.20 to 59.20
Four-inch, Birmingham	53.00 to 54.00
Six-inch and over, Birmingham	49.00 to 50.00
Four-inch, New York	63.60 to 65.50
Six-inch and over, New York	59.00 to 60.00
Three-inch, Birmingham	59.00 to 60.00

Class A pipe is $5 higher than Class B.

Standard fittings, Birmingham, base, $110.00 6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Scrap Appears Firmer

Some Price Weakness Still Is Shown—Consumer Buying Continues Small but Consumption Is Heavy—Much Material Available

SCRAP PRICES, PAGE 1640

Chicago, May 29.—Further weakness has been registered in iron and steel scrap in this market, heavy melting steel having declined about 50 cents per ton. Most existing contracts will end with the present month and the few that extend further are not sufficient to be a factor. Users have fairly large stocks and will have more tonnage by the middle of the week. This will be sufficient to keep them out of the market for a time and the large supply coming out will have a tendency to depress prices further in the face of small buying. Foundry and rolling mill demand is small. Railroad offerings continue to come out in fairly large volume and the market has difficulty in absorbing the supply, especially when industrial and country scrap continue to come out freely. Indications are that the summer will be dull and prices fairly low, compared with those prevailing at the beginning of the year.

Cast Grades Decline

Boston, May 29.—Continued dullness in foundry grades has resulted in a further decline in the price of No. 1 and No. 2 cast. Sales of textile castings have been reported at $24.50 delivered and $25 is the top price reported for recent sales of cast scrap. Heavy cast has sold at $18 shipping point which means about $22 delivered. Heavy melting steel has been in slightly increased demand and the downward tendency in price has apparently been checked. Sales at $15.50 were reported 10 days ago and sales within the last two or three days have been made at this same figure. Dealers are commencing to talk higher prices. Inquiry is improved and while sales are still without much volume an underlying current of cheerfulness has developed.

Prices Are More Steady

New York, May 29.—For the first time in several weeks, prices in the local scrap market are steady. While some dealers believe the end of the recent downward movement has not yet been reached, the tone of the market is better. This improvement in sentiment, however, cannot be attributed to any great activity in demand; in fact, buying at present is relatively quiet. It appears to be due somewhat to prospects of continued heavy mill operations throughout the remainder of the year and to less free offerings at the source.

No Large Sales Recently

Pittsburgh, May 29.—Since the recent flurry in the scrap market due to the cumulative effect of one large independent producer's purchases, no real buying as been encountered. Such sales as have been consummated have been of such small amounts, they are unimportant from a market standpoint. Some of the larger makers still continue their practice of duplicating pig iron or of utilizing their own scrap. The Carnegie Steel Co., continues to deliver scrap locally by barge from Mingo Junction, O. Heavy melting steel apparently is pegged for the time being at $21.50 to $22. A few other grades are down from the levels of a week ago. An increasing amount of unassorted scrap is finding its way into market channels, chiefly from railroads.

Buying Is Limited

Buffalo, May 29.—The market for scrap iron and steel continues to slump with almost a complete stoppage of buying. Consumers are not buying and dealers have about filled all orders on hand. Consumers are rejecting large quantities. Dealers are exercising their privilege of rejecting in transactions with other dealers. Heavy melting steel is now quotable at $20 to $20.50.

More Declines Noted

Philadelphia, May 29.—Buying of scrap iron and steel was small during the past week. The market is further off on some grades, while on others there has not been enough business done to test the prices. Dealers are somewhat pessimistic as to the future prices of scrap.

Believe Price Bottom Reached

Cincinnati, May 29.—With practically no changes in iron and steel scrap prices during the past week, dealers believe the bottom of the present downward movement reached. The market continues weak from the standpoint of buying. Little interest is being manifested by the industries. About the only transactions are between dealers. Steel works are well covered for the next 30 days and inducements in the way of price concessions have failed to tempt them. Practically no inquiries are current and sales involve small tonnages. The paramount reason for the check in the downward movement of prices is largely due to the fact dealers are in the market for immediate shipment material to apply on contracts. Scrap yards are blocked with material and sufficient labor cannot be obtained to sort and prepare it. Consumption in this district continues high and it is believed buying must be resumed shortly. The recent price declines have served to cut off forwardings from the country dealers. Railroads on the other hand are offering liberally. The underlying strength in the market is exhibited by dealer's unwillingness to part with tonnage at any concession in trading among themselves.

Price Trend Downward

St. Louis, May 28.—Further downward revisions in dealers' lists feature the market for scrap iron and steel. Absolutely no interest is being manifested by consumers and exchanges between dealers are extremely limited. Some purchases, mainly to satisfy short commitments, were reported The American Steel Foundries Co., has satisfied its requirements and the other steelmakers are out of the market for the time being.

Yard stocks are congested, due to the recent heavy shipments and lack of outlet. Material on track is adding to the general weakness. Rolling mill grades are not in demand, and the same is true of cast grades. Steel car axles were marked down $1 to $30, and cuts were made on rails for rolling, cast borings, heavy turnings, railroad malleable and some steel specialties. Busheling is relatively stronger than other items, due to covering of short sales.

Offerings by the railroads have declined the only list before the market being one by the Wabash, including 500 tons of light sheets. The movement from the country has subsided. Advices from other points indicate weakness on a parity with those existing here. Price spreads between eastern centers and this market are too narrow to permit of profitable shipment.

Market Is Easing Up

Birmingham, Ala., May 28.—The scrap iron and steel market is easing up considerably, and little new business is being placed. Present orders assure shipments for six and eight weeks. Stocks of old material are being kept up. Trouble is being experienced in keeping labor in old material yards, other industries making better offers.

Weakness Still Prevails

Cleveland, May 28.—Iron and steel scrap is exceedingly quiet. No new buying is being done although movement on contract is generally heavy. As a result the market is weak, prices having dropped as much as $2 a ton in several instances. Heavy melting steel is down from $22.25 to $22.50 to $19.50 to $20; machine shop turnings down 50 cents to $16.75 to $17; hydraulic compressed sheets down $2 to $18.50 to $19; cast borings down $16.75 to $17; heavy cast down $1 to $19 to $19.50. In the valley heavy melting steel is down 50 cents to $22 to $22.50 and hydraulic compressed sheets down $1 to $21 to $21.50. The outlook is not encouraging.

Moderate Sales

Of Ferromanganese Made at $125—Demand for Spiegeleisen Is Active

FERROALLOY PRICES, PAGE 1575

New York, May 28.—Only moderate lots of ferromanganese have been sold during the past week by New York merchants. This business has been booked on the basis of $125 duty paid tidewater for standard ferromanganese for nearby and third quarter delivery. Domestic ferromanganese for the fourth quarter continues obtainable at $120 duty paid tidewater or furnace.

An active demand has featured the spiegeleisen market during the past week but because of the extent to which the supply is sold up, very little business has been placed. In fact, sales of the past week which are reported here, involve only a few carloads. The market continues to be quoted at $45 to $47.50 furnace for 20 per cent metal

for future shipment and at $50 for spot carloads.

Market Is Dull

Pittsburgh, May 29.—Excessive dullness characterizes the ferroalloys market. Sellers who have tonnages to offer of the various alloys have canvassed the situation thoroughly without being successful in locating prospective buyers. Consumers for the most part are protected on requirements at least to July 1 and they deem it too early to enter into contractial arrangements beyond that date. Some are protected through the third quarter and a few have made deals for the entire last half. In connection with ferromanganese quotations for the last quarter are unchanged at $120, seaboard base; for prompt delivery the price is $130, while small lots on which one or two inquiries now are out for 5000 to 10,000 pounds each, $140, seaboard base is quoted. The freight rate to Pittsburgh common points per ton of ferromanganese is $4.79.

Spiegeleisen interest is increasing. Several inquiries are out ranging from 50 to 1500 tons, some representing last quarter requirements. Consumers are not pressing the market for quotations being content to wait believing that plenty of spiegeleisen will be available. At present prices are unchanged at $44 to $46.50 furnace, for the 16 to 19 per cent and $45 to $47.50 for the 19 to 21 per cent material.

Spiegeleisen In Demand

Chicago, May 29.—The market for ferroalloys is mostly dull. Ferromanganese is steady at $125 to $130, seaboard. Spiegeleisen is in demand, the spot price being $56 delivered, and contract price $53. Some shading is being done in the East on future bookings. Ferrosilicon is inactive in this territory.

Strip Buying Restrained

STRIP PRICES, PAGE 1575

Pittsburgh, May 29.—While new buying of hot and cold-rolled strip steel for the third quarter is restrained, a few contracts are being closed at current market figures of 3.30c on hot and 5.25c on cold, base Pittsburgh. Specifications on contracts are heavy and occasional purchases for filling in purposes are fairly numerous. Occasional quotations still appear on hot-rolled up to $3.50c and on cold-rolled up to 5.50c, base Pittsburgh.

May Adjust Claims

Washington, May 29.—An adjustment of the Bethlehem Steel Corp.'s claims against the shipping board for savings effected on war contracts is understood to be in process, and this adjustment probably will offset the adverse ruling of the board's claim committee. The Bethlehem contracts, like others, stipulated a fixed fee plus a percentage of economies which would bring the cost below the one stated in the contract. The Bethlehem claims aggregate $8,500,000. The board takes the stand that contractors were bound to effect economies without receiving any reward. The board may relinquish to the Bethlehem company improvements at three plants made at government expense.

Semifinished Sales Light

Bookings for Third Quarter Deferred by Steel Producers—Sheetmakers To Close at $45—Billets Sold at $43 in East

SEMIFINISHED STEEL PRICES, PAGE 1575

Pittsburgh, May 29.—Bookings of future semifinished business are being deferred. Many producers require all the semifinished material they produce in their own finishing departments or to apply on their contracts. They quote prices purposely high. Other producers have no open-hearth steel to offer and most of the inquiries are for open-hearth material. This condition makes necessary the consideration by the customer of whether or not bessemer steel can be utilized. Deliveries on contracts continue at a high rate but in many cases not so high as customers would wish. This condition makes the buyer concentrate on efforts to get material in on order rather than on lining up future requirements. Occasional inquiries come out for sheet bars, billets and slabs in fair sized tonnages, and from time to time these are closed. One Pennsylvania producer this week closed on 1500 tons of 1¼-inch bessemer billets at $45, Pittsburgh base, price and quoted $50 Pittsburgh base, on another inquiry for 1200 to 2000 tons of open-hearth billets. Forging billet customers will be protected on their third quarter requirements at $55, Pittsburgh base, for at least July shipment. August and September requirements will be priced later. Larger supplies of skelp are available but the market has not weakened to any great extent, and remains quotable at 2.45c to 2.65c, base Pittsburgh. Pipemakers who buy their skelp have more on hand than they know what to do with since they only can operate at two-thirds of capacity on account of curtailed labor supplies. Some of the tonnage they cannot accept is understood to be pressing the market. A fair demand still exists for wire rods, which are unchanged at $51 to $55, base Pittsburgh. One or two sales of 200 tons apiece have been noted at the $55 price.

Billet Prices Lower

New York, May 29.—The billet market, as a result of more competition, reflects lower prices. Lots of rerolling billets aggregating several thousand tons have been sold at prices ranging from $43 to $45, base Pittsburgh. In New England, sales have been made to nearby consumers at concessions from this level. The market on forging billets, on the basis of business done during the past week, may be quoted at $53 to $55, base Pittsburgh. Included in pending business is one inquiry for 10,000 tons of rerollers.

Tonnage Still to Be Closed

Youngstown, O., May 29.—Some consumers of sheet bars are holding their third quarter requirements in abeyance until they determine whether the price of $45, Youngstown, will permit them to show a profit on 3.85c sheets. Meanwhile several users have contracted for their third quarter tonnage at $45, Youngstown, and the quantity of business closed by one producer is sufficient until well into September. Inquiry for slabs, billets and sheet bars still is lacking from transient consumers although a good volume of sheet bar tonnage remains to be closed.

Billet Tonnages Placed

Philadelphia, May 29.—Several fair billet tonnages have been placed at somewhat lower prices. The market now is $43 to $45, base Pittsburgh, for rerollers, and $53 to $55 for forging quality.

Large Tonnage Booked

Cleveland, May 29.—The leading maker of semifinished material in this district has booked around 150,000 tons of sheet bars, billets and slabs for the third quarter, practically all of its capacity having been obligated for that period. A little business was taken in the past week. Prices to apply on this tonnage are those prevailing at time of delivery. A fair demand continues to be felt in this territory. The only free tonnage sold on which a specific quotation was named is that of around 400 of off-grade material at $45, Pittsburgh.

Brokers are offering slabs in this market at $45, this price being quoted this week on an inquiry for 2000 tons. Wire rods are freely offered by makers at $55.

Tin Plate Needs

Exceed Makers' Current Outputs—Much Business Declined

TIN PLATE PRICES, PAGE 1575

Pittsburgh, May 29.—With foreign tin plate sources shut off by higher prices, higher delivery costs, etc., many consumers are disappointed at finding domestic tin plate mills so well filled with orders they are obliged to turn down new business. They either do not buy, endeavor to satisfy their needs from stock lists, or else purchase for deliveries at a later date. Some of the larger tin plate producers have obligations on hand or reservations against future output for more than they can make to the end of September, and little hope is expressed for bettering the operating rate which at present averages between 75 and 85 per cent. That this is not higher is due to a shortage of tin house and other skilled forms of labor. The American Sheet & Tin Plate Co.'s price of $5.50, per base box, 100 pounds, Pittsburgh, is representative of the general market since many of the independents have accepted contracts from regular customers at that level. Occasionally a $6 price still is heard and thus the market is unchanged at $5.50 to $6, base Pittsburgh.

The Norwalk, O., mill of the Crucible Steel Co. of America, Pittsburgh, probably never will be opened again. The plant was closed at the end of the war.

Bar Deliveries Sought

Third Quarter Business Being Taken—Consumers Clamoring for Material Specified—Makers Heavily Booked—Market Quoted 2.40c to 2.50c

BAR PRICES, PAGE 1575

Chicago, May 29.—Merchant steel bars users still are clamoring for deliveries showing their need for material. Inquiry is active though less than in the earlier part of the month. The leading producer is quoting steel bars at 2.50c Chicago mill. Third quarter business has been closed at 2.60c by independents. Automobile builders are taking about the same amount of material as formerly and buying in general is practically the same as it has been for some time past. The Illinois Steel Co. continues to operate all of its furnace stacks.

An eastern steel bar producer recently booked about 2000 tons for delivery in the Chicago district at 2.50c, Pittsburgh, and some at 2.55c, Pittsburgh. This was a limited tonnage on which June delivery could be made.

Bar iron is steady at 2.60c, Chicago, with steady demand which keeps backlogs fairly even. The market for this material appears restricted and there is no sign of heavy demand. Rail steel bars are in demand for reinforcing work as well as for agricultural implements and other uses and the price is steady at 2.30c, mill, with 2.40c, mill, obtained occasionally. One producer is booked beyond the middle of the year.

Third Quarter Buying Done

Pittsburgh, May 29.—Third quarter buying of merchant steel bars is under way; various customers protecting themselves as to tonnage. This is not always at 2.40c, base Pittsburgh for the entire quarter, producers quoting that basis on large tonnages for July shipment, prices on August and September tonnages to be settled on when specifications are received. On smaller lots 2.50c, base Pittsburgh still applies for prompt deliveries. Needs during the third quarter promise to compare favorably with the large consumption true of the present quarter. Some specifications continue to arrive on second quarter contracts but the main activity of consumers is confined to efforts to have the mills make increased deliveries of the material already specified. Occasionally a small filling-in tonnage too is closed in the way of new business. Refined iron still is quotable at 3.15c to 4.85c, depending upon the degree of refinement. Buying is steady.

New Tonnage Declined

Youngstown, O., May 29.—Makers of soft steel bars in this district are booked well into July. The current volume of inquiries is indicative of good business throughout next quarter. Tonnage for early shipment is being refused right along. A good demand exists for small angles and orders for several hundred tons are to go on schedule this week. Soft steel bars are quotable at 2.40c, Pittsburgh.

Demand Is Fair

Buffalo, May 29.—Demand for merchant steel bars is fair with car builders furnishing the source for most of the business above 100 tons. Jobbers are having shipments moved forward freely, and smaller jobbers having no stocks, are buying. Prices range from 2.40c to 2.50c.

Fewer Sales at 2.40c

Boston, May 29.—Sales of bars have been fair in New England during the past week, and it is noticeable that a smaller percentage has been placed at 2.40c, Pittsburgh than was the case a week ago. One producer estimates that 60 per cent of the recent tonnage placed has been at 2.50c. This appearance of stiffer prices is the more noticeable in the face of a reduction in warehouse prices.

Premium Prices Disappear

Philadelphia, May 29.—Premiums have largely disappeared on steel bars and the market both nearby and third quarter shipment now is quoted at 2.40c to 2.50c base Pittsburgh. In some instances consumers report having shaded 2.40c, but this has not been substantiated. Considerable third quarter business has been placed at 2.50c although the major portion has gone at 2.40c. Incidentally mills which some time ago booked some third quarter business at 2.75c have reduced to the current level. Mills did not canvass the market generally for third quarter business, but mostly confined orders to regular customers. From 50 to 75 per cent of these customers accepted the mills' offer while the remainder decided not to contract and take chances later on a lower market. Iron bars are quoted 2.50c base Pittsburgh and in some cases higher, while in some instances lower.

Early Tonnage Offered

Cleveland, May 28.—One independent maker has been offering steel bars in this territory the past week for three or four weeks delivery at 2.50c, Pitsburgh, or $2 per ton above the generally accepted level. Deliveries with most producers remain a matter of several months and early bars are difficult to obtain. Very little new business is being put through in this territory even though the mills are more receptive in taking business and current specifications also are not so heavy. The mills, however, with accumulated specifications over several months, are tightly pressed with obligations and deliveries are not improving. Some reports of shading on bands and also light hoops have been current recently.

Cold-Drawn Buying Moderate

Pittsburgh, May 29.—New buying of cold-drawn steel bars is more or less moderate but the encouraging feature is that it is sustained and comes from divesified industries. Many consumers have not yet contracted for third quarter supplies and for the time being are purchasing filling-in tonnages only. Shipments are heavy and makers are clearing up order books, since they overlap incoming orders. Some producers will have discharged their second quarter obligations by June 15 and then will be ready to entertain third quarter contracts. The price is unchanged at 3.25c, base Pittsburgh.

Improvement in Demand for Bolts, Nuts, Rivets

NUT AND BOLT PRICES, PAGE 1636

Pittsburgh, May 29.—Single carload orders for nuts, bolts and rivets are more numerous and specifications on contracts represent a fairly large tonnage. The improvement which set in two or three weeks ago after a short period of dullness, promises to continue, since consumption continues at a rapid pace. Prices are stronger.

Demand Seems Lessening

Chicago, May 29.—Bolt and nut sellers find demand far from satisfactory and specifications as well as current inquiry is below that of preceding weeks. This has not yet reached the point of unsettling prices and shading has not been resorted to, though this may result if a change does not take place soon. Contracts for third quarter are due to be negotiated shortly but no signs has appeared yet of users being anxious to close.

Specifications Fairly Heavy

Cleveland, May 29.—Specifications against contracts for bolts, nuts and rivets are satisfactory and prices are being held firmly at the established levels. New business is not in as large a volume as it was several weeks ago but is still of fair size. Rivet demand is on a par with that of bolts and nuts.

Hoop Bookings Are Heavy

HOOP PRICES, PAGE 1575

Pittsburgh, May 29.—All hoop and band producers have enough business for two or three months to come, having latterly been booking some attractive third quarter business. Here and there a tendency is encountered among consumers to hold back new business but in the main consumption bids fair to proceed along the lines established during the present quarter. Specifications are coming from diversified lines of consumption and while in automotive lines there promises to be somewhat of a setback, this will not be as large as usual. The price is unchanged at 3.30c to 3.50c, base Pittsburgh on regular hoops and bands and 3.50c to 3.75c on the small hoops.

Ore Is Received

Philadelphia, May 29.—Imports at Philadelphia for the week ending May 26 were as follows: Manganese ore, British Africa, 6832 tons. Portuguese East Africa, 5225 tons iron ore; Algiers, 10,000 tons and Cuba 6900 tons; scrap steel, England, 106 tons; scrap brass, England, 200 tons; ferrosilicon, Norway, 100 tons, and from Germany 99 tons.

Act on Basing Point Bill

Chicago, May 24.—A bill before the Illinois legislature calls for an investigation of the Pittsburgh basing point practice. It has passed the senate, has been

recommended by the house judiciary committee, and has been acted on favorably by the house committee on appropriations. The bill appropriates $25,000 to be used by a committee of five to be appointed by the government. The duties of the committee will be to start legal actions and cooperate with other midwestern states in an effort to do away with this market practice.

March Registers Gain in Immigration

Washington, May 29.—In March, 42,888 immigrant aliens entered the United States and only 3610 aliens departed, making the net gain for the month 39,278, states the immigration bureau of the department of labor. For the nine months ended with March, immigrant arrivals totaled 373,511 and emigrant departures 65,775, making the net gain for the first nine months of the fiscal year 307,736. For the year the 3 per cent act admits only 357,803 aliens.

Immigrant arrivals in the 9-month period included 45,772 Hebrews, 42,615 Germans, 40,769 Italians, 39,431 Mexicans, 37,288 English, 23,251 Scotch, 22,012 Scandinavians, 20,403 Irish and 17,220 French. Emigrant departures in this same period by race included 20,077 Italians, 6035 English, 4593 Polish, 3065 Chinese and 2618 Greeks. By countries, the immigrant and emigrant movement in the nine months ended with March was:

	Immigrants	Emigrants
Austria	7,954	177
Hungary	5,851	768
Belgium	1,533	484
Bulgaria	387	134
Czechoslovakia	13,727	1,675
France	3,466	1,090
Germany	27,165	1,196
Greece	3,253	2,552
Italy	44,570	19,900
Poland	25,107	4,758
Rumania	11,688	989
Russia	16,454	2,116
Sweden	10,543	664
United Kingdom:		
England	16,689	4,134
Ireland	11,929	1,089
Scotland	14,926	594
Wales	901	29
Yugoslavia	6,104	1,688

Immigrants in the nine months included 11,816 professionals, 72,204 skilled workers and 149,722 classified as miscellaneous. There were 1709 professional engineers, 2431 iron and steel workers, 2538 machinists, 1872 engineers, 416 metal workers, 3942 miners, 141 patternmakers, 18,293 farm laborers and 57,281 laborers. These immigrants specified they were going to the following states: 100,492 to New York, 27,484 to California, 27,014 to Illinois, 26,973 to Massachusetts, 30,870 to Pennsylvania, 27,763 to Texas, 13,936 to Ohio, 21,869 to Michigan, 19,638 to New Jersey, and 7169 to Connecticut.

The following table shows immigrant arrivals, emigrant departures and the net gain of aliens for the fiscal year to date:

	Immigrants	Emigrants	Net gain
July, 1922	41,241	14,738	26,503
August	42,735	10,448	32,287
September	49,881	7,527	42,354
October	54,129	7,192	46,937
November	49,814	7,077	42,737
December	33,932	8,157	25,775
January, 1923	28,773	4,232	24,541
February	29,927	2,794	27,133
March	42,888	3,610	39,278
Fiscal year to date	373,511	65,775	307,736

Plate Market Less Active

Some Fabricators Covering Third Quarter Requirements, but Large Tonnages Are Lacking—Inquiry Pending in East for 10 Car Floats

PLATE PRICES, PAGE 1575

New York, May 29.—The Atlantic Refining Co. has placed an order with the Bethlehem Shipbuilding Corp. for a 10,000-ton oil tanker. The vessel has to be shipped immediately out of stock by the shipbuilding company. The Pennsylvania railroad has placed an order for 10 car floats with the New York Shipbuilding Corp. No decision yet has been reached with respect to other shipbuilding work on which bids recently have been submitted.

New Tonnage Still Lags

Chicago, May 29.—In the continued lack of railroad car and tank buying, which loaded plate mills with tonnage early in the year, this department is relatively quiet as to new business, while the efforts of producers are concentrated on the effort to make deliveries to meet the requirements of buyers who need the material. While the quotation is 2.60c, Chicago mill, on the part of the leading producer, some tonnage of plates has been sold recently, on which delivery will be made in third quarter, at 2.80c, Chicago mill, buyers being willing to pay this price for material at so early a date. The tonnage covered at this price has not been large but is sufficient to demonstrate the demand and the willingness of users to pay the price if the plates can be delivered.

Covering for Third Quarter

Pittsburgh, May 29.—Fair size tonnages of plates for various purposes are being closed. Certain large fabricators are covering their third quarter needs. While boilers, barges, cars, locomotives, etc., continue to require much tonnage, oil tank and still awards have fallen off and none of size is pending. Most inquirers for oil tanks want from one to three tanks each. The usual price on plates continues to be 2.50c, base Pittsburgh. In some cases this applies for either prompt delivery or for third quarter contracts. Certain platemakers will not accept a contract with the price protected at 2.50c for more than July shipment. August and September shipments are to be priced later in harmony with the market prevailing at time the specifications are furnished.

Plate Business Small in Volume

Philadelphia, May 29.—More miscellaneous plate business was transacted during the past week than the week before, but the volume is smaller than shipments generally. Prices continued unchanged, although on some nearby shipments, eastern mills quoted 2.50c, base Pittsburgh. This figure is exceptional and nearby business continued to be booked at 2.60c to 2.65c, base Pittsburgh. Mills generally continue 2.50c base, but cannot give assurance of delivery. The Philadelphia & Reading railroad placed some plates during the past week has not acted as yet on its 1500 ton inquiry. The Pennsylvania railroad distributed further tonnage to Pittsburgh mills last week. Included in the pending inquiries is one for 2500 to 3000 tons of plates for oil storage tanks.

Quiet Market Prevails

Cleveland, May 29.—While buyers are manifesting a better feeling, they are not increasing their orders with the mills to any extent and the market is quiet. The current market is made up principally of small lots and where early delivery on these is required, premiums continue to be paid. Eastern makers still are selling some tonnage in this territory for delivery in the next few weks at 2.75c, mill. The general price of the market remains 2.50c, Pittsburgh, although one large producer which is in position to ship more promptly than others has been asking 2.60c in some cases.

President Disappointed at 12-Hour Day Report

Washington, May 29.—While President Harding is understood to be disappointed over the report on the 12-hour work day submitted to the American Iron and Steel institute last Friday, and at the apparent inability of the steel trade to abolish the long day, no further action here is expected. It is pointed out that the departments of labor and commerce and the sentiment of congress are wholly against modifying immigration restrictions, and the report is likely to have no effect in this direction if it was so aimed.

President Gompers, of the American Federation of Labor, has issued statements attacking the committee's report, and asserts: "I must believe that the 12-hour day is an institution and the steel industry never intends giving it up." He declares that increased efficiency will offset increased cost and that the supply of labor is ample. Assistant Secretary of Labor White and Immigration Commissioner Husband are at Montreal conferring with immigration authorities in an attempt to end smuggling of aliens across the border.

Furnace To Be Built at Central Steel Site

Massilion O., May 29.—Construction of a blast furnace and auxiliary plant by the Central Steel Co. was assured for Massillon when the company succeeded Saturday in securing an option on 185 acres, Clarence Herbruck, counsel for the company announced. Purchase of a large block of stock of the Central company by the Cleveland Cliffs Iron Co. a few weeks ago inspired a report that the furnace might be erected in another city. Objection of the company to building inside the city limits of Massillon lead to the repeal of an ordinance annexing the section desired as a site.

Securing of the option removed the last obstacle to the construction of the plant. Work on the new furnace will begin in August. Several months will be required for the preparation of plans.

Concrete Market Inactive

Heavy Commitments Make Mills Not Anxious for New Business—Lettings Continue Small and Few—Some Shading of Prices

REINFORCING BAR PRICES, PAGE 1575

Chicago, May 29.—Somewhat smaller total of reinforcing bars is being booked at Chicago, although the difference is not marked. Most sellers are willing to let the situation continue slack, inasmuch as they have heavy commitments through the summer months and as they do not desire to obligate themselves further at this time. The matter of price from steel mills for third quarter delivery is not yet definite and this is another factor in holding back sales. At the same time builders are slow to close for their requirements until labor difficulties have been definitely decided. Wage advances have been asked for June 1 and buying probably will lag until after that date. It seems likely there may be an increase of buying when this situation is clear. Quotations continue steady at 3.15c, Chicago store, and western sellers have shown no tendency to shade this price. Some barmakers in the east appear to be shading and on a pending project in the west as low as 2.80c, Chicago, has been quoted for July delivery. This competition has not seriously affected selling by Chicago dealers.

More Projects Closing

Pittsburgh, May 29.—Several more concrete bar projects are being closed up, including the local freight house for the Baltimore & Ohio railroad. Details are not available as yet in this connection but the Truscon Steel Co., has been awarded 140 tons for the Oliver high school by the P. T. Kelly Construction Co., which received the general contract. The Truscon company received the order also for the gymnasium for Carnegie Institute of Technology, amounting to 100 tons. A smaller tonnage went to the Concrete Steel Co., for the St. Patrick's school at Cumberland, Md. Bids close June 1 on 50 tons for the Weirton, W. Va., school. Prices are unchanged at 2.40c to 2.50c, base Pittsburgh, although it is true that an occasional lot is made available to fabricators at around 2.30c, mill.

Inquiry Becomes Stronger

Cleveland, May 29.—Lettings of contracts for reinforced concrete bars continue light in this district, although inquiry for jobs of small tonnages increased considerably. Interest is centered on the letting of the contract for the 1400 tons of bars in the coagulation basin of the Baldwin reservoir project, the general contract for which will probably be awarded to Stange Walsh Construction Co. low bidder. Bids are in on the public library building, requiring 300 tons, and an award of contract is expected shortly. The price on goods out of stock remains strong at 2.90c, with no indication of a tendency to shade. For new steel bars 2.40c, base Pittsburgh, is being quoted as is 2.50c, base mill, on rail steel bars.

CONCRETE CONTRACTS PLACED

Awards this week	2,470 tons
Awards last week	4,925 tons
Awards two weeks ago	4,050 tons

700 tons, power house for Illinois Electric Co., Peoria, Ill., to Kalman Steel Co.

450 tons, building for St. Vincent's Home for the aged, Seattle, to Pacific Coast Steel Co.

300 tons, Baltimore & Ohio freight house, Pittsburgh, to unnamed fabricator.

260 tons, two school buildings, Minneapolis, Minn., to Concrete Steel Co.

200 tons, Piper hotel, Madison, Wis., to Kalman Steel Co.

140 tons, Oliver high school, Pittsburgh, through P. T. Kelly Construction Co., to Truscon Steel Co.

120 tons, highway work in Illinois, to Concrete Steel Co.

100 tons, highway work in Wisconsin, to Kalman Steel Co.

100 tons, memorial auditorium, Racine, Wis., to Kalman Steel Co.

100 tons, gymnasium at Carnegie Institute of Technology, Pittsburgh, to Truscon Steel Co.

CONCRETE CONTRACTS PENDING

1400 tons, coagulation basin of Baldwin reservoir project, Cleveland; Stange Walsh Construction Co., low bidder.

700 tons, Northwestern States Portland Cement Co., Mason City, Iowa; bids in.

Tonnage not given, for Union Station headhouse at Chicago. Bids to be opened June 6.

Pipe Makers

Hindered by Labor Shortage in Discharging Obligations

PIPE PRICES, PAGE 1575 AND 1636

Pittsburgh, May 29.—Labor shortages in pipe plants are a detriment to the discharging of current obligations and cause hesitancy about accepting new business. While some makers report they encounter a tendency to hold back new business, others state they continue to have difficulty in meeting new demands. They all stress the importance of the fact they are receiving no cancellations whatever. All makers report the case of the National Tube Co., as generally typical in that they do not have one customer on the books who is entirely satisfied. This is particularly true of jobbers of standard full-weight pipe. The huge house and apartment building program under way in practically every section leaves them with unbalanced stocks, notwithstanding their strenuous efforts and the keen efforts of the mills to keep them even. Jobbers of oil country goods, line pipe, etc., are particularly keen to have the material on order shipped out since projects already started cannot be completed. Day to day buying of pipe represents a sizable aggregate, although conservatism is encountered in connection with buying of a speculative character. The discounts of April 19 are holding firmly, although of course the majority of shipments being made still are being billed at the old prices, since they are upon old contracts. Pipe mills generally are not operating beyond two-thirds of capacity.

No Large Tonnages Out

New York, May 29.—Demand for cast iron pipe is still devoid of outstanding tonnages, although the market is far from dull. Undoubtedly much tonnage is held back because of the deferred deliveries offered by most makers, September shipment appearing to be about the best. Prices are strong.

Little Activity In West

Chicago, May 29.—Little activity has been evident in the cast iron pipe market, both buyers and sellers being out of the market for the most part. There is lack of inquiry. At the same time producers do not care to push the market and many are selling only to regular customers and refraining from bidding on many projects that come up for figures.

Lettings Are Small

Birmingham, Ala., May 28.—Cast iron pipemakers in this district are receiving lettings in smaller amount, but marked activity is shown in producing and delivering against old contracts. The melt of pig iron by the pressure pipe makers continues high. Quotations are firm. The larger producers have placed orders recently for more than 20,000 tons of iron to provide for orders. Middle West and some Southwest business was placed in the past week. Sanitary pipe makers are operating almost to capacity but new business is slow.

Wire Producers

Are Forced To Decline Much New Tonnage—Prices Steady

WIRE PRICES, PAGE 1575

Pittsburgh, May 29.—An interesting development of the wire market is the extent to which valley producers of wire products have been offered tonnage which they have been unable to accept. One such lot of manufacturer's wire involved 1200 tons and another amounted to 2600 tons monthly for the remainder of the year. The former was finally placed with a Portsmouth, O., mill; the other requirement still is pressing the market. Nails likewise continue difficult to obtain, due to the numerous orders on makers' books, which they would like to get shipped before accepting more. The usual market prices on wire and wire nails are 2.75c and 3.00c, base Pittsburgh, respectively. One or two makers are selling nails at higher prices such as 3.10c and report numerous less-than-carload sales at 3.45c, 35 cents being the usual differential for less than carload quantities. At least one maker is quoting a 3.00c, base on wire. Obligations still are heavy on cement-coated nails although new buying is not as pressing as it was two months ago. From 2.70c to 2.75c, base Pittsburgh still is quoted. Now that fall terms are available on fencing, and on mixed carloads of fencing, barbed wire and nails, the buying is heavier and bookings the past week or 10 days of fairly large tonnages for the farmer trade were numerous.

Wire Mills Still Behind

Chicago, May 29.—Producers of wire and nails see no chance of catching up on orders as it seems impossible for them to increase their production in the face of present labor supplies. Efforts to place further tonnage are met by booking part of the tonnage asked in proportion to the tonnage now on books, and this keeps the backlog at about the same size. Price is not considered and buyers place much more stress on delivery and ability to get on books. Jobbers in general have

not been able to accumulate stocks and as a rule ship out their material on order as fast as it is received. Prices are steady and unchanged.

Warehouse Demand Steady and Prices Hold

WAREHOUSE PRICES, PAGE 1632

Chicago, May 29.—With mill prices stationary warehouses have not made any change in recent weeks and give no indication of altering the present schedule. Demand for steel continues good and practically every line is asking for heavy supplies. No cessation in demand for structural steel has been evident here, while general manufacturers continue to require as much as usual to keep up with demands for their output. Some sections are out of stock, though mill deliveries have been somewhat better recently. Sheet stocks are relatively full and there is little delay in meeting requirements in this stock.

Jobbers Prices Down

Boston, May 29.—New England warehouse prices, which it is claimed were advanced abnormally high because of the freight congestion, have been marked down from a base of 3.715c to 3.615c. The principal Boston houses report no letup in demand and a marked improvement in mill shipments.

Demand Continues Brisk

New York, May 29.—Although the month now closing was less active than April, jobbing demand continues brisk. In some quarters the good volume of present business is regarded with little less than surprise, as there is usually a pronounced slowing up at this season. Undoubtedly a part of present activity is due to caution on the part of consumers, who are uncertain as to future mill prices and, therefore, are turning to the warehouse for their immediate needs instead of contracting ahead. Prices are steady.

Prices Are Unchanged

Philadelphia, May 29.—Prices on iron and steel out of warehouse continue unchanged. Dealers report demand continues large not only from regular warehouse customers but from mill buyers.

Fair Demand Reported

Cleveland, May 29.—Jobbers in iron and steel products here report demand continues of fair size. A leading dealer in sheets states that individual orders are larger, ranging from 1 to 15 tons, and are being received in considerable volume from regular mill buyers. The Carnegie Steel Co.'s warehouse reports that its total jobbing business during May was about 50 per cent less than that of April.

Axle Plant is Sold

The Cincinnati plant of the Standard Parts Co., Cleveland, has been sold at auction for $136,000 to Albert J. Mayer, Cincinnati realtor. The plant in its entirety was offered by Frank A. Scott, receiver in the suit of the Erie Malleable Iron Co. against the Standard Parts Co. The plant was the Hess Spring & Axle division of the Standard Parts Co.

Sheet Activity Better

Moderate Interest Noted in Market at Youngstown—Independents Quoting Prices Nearer Levels of Leading Maker

SHEET PRICES, PAGE 1575

Youngstown, O., May 29.—Renewed interest is being shown by sheet consumers on a small scale. While there is no concerted effort to place tonnage, yet from indications early this week the market has improved. Prices have become more clearly defined and the figure of 4.00c which was asked for No. 28 black by a few producers early this month, has definitely disappeared in favor of 3.85c, base Pittsburgh. Of the three grades of common sheets, black is the most difficult to uncover and one mill which was short of specifications of this grade early this month is understood to have solicited sufficient tonnage at 3.85c to balance up its rolling schedule. However, efforts to obtain black under 3.85c, Pittsburgh, in the market here at present would be of no avail. Blue annealed is strong at 3.00c, Pittsburgh, and some producers have experienced no difficulty in selling certain gages at 3.25c. Activity in this direction is attributed to the relatively small number of jobbing mills and to the tonnage under demand being far in excess of what the mills can produce for reasonably prompt delivery. Realizing the tightness of mill schedules until well into next month, consumers of blue annealed show no hesitancy to contract for third quarter tonnage. Galvanized also continues in demand and easily commands 5.00c Pittsburgh. Only two producers in this district now are catering to the galvanized trade. Orders for fine finish sheets for third quarter are being received in good quantity. The price for this grade for shipment next quarter is firm at 5.35c, for No. 22, Pittsburgh.

Obtain Premium on Black Sheets

Buffalo, May 29.—Sheet demand is good. On black, most of the independents are obtaining 4.10c, Pittsburgh, a premium of $3 a ton over the leading interest. Some independents are asking a premium of $5 a ton.

Prices Nearer Corporation's

Pittsburgh, May 29.—Considering the American Sheet & Tin Plate Co.'s prices on sheets as par, the market quotations of independents continue to seek those levels. This is particularly true of the black and galvanized grades, so that the spread in black sheets has practically disappeared leaving the market quotable at 3.85c, the Steel corporation level. Reports are current of quotations made at 3.75c, but so far as can be learned here no mill as yet has quoted that price. Buyers believe they will be able to close at that price and are withholding their orders with that hope. One this week offered a tonnage in excess of 500 tons monthly but as indicated sellers here have not yet reached the stage where they are willing to cut prices. In galvanized the top of the market now is 5.25c as against a recent high of 5.50c, base Pittsburgh. The American company's level is 5.00c. While there is an over production of black sheets there is an under production of galvanized. Blue annealed still is quotable at 3.00c to 3.35c. Some makers have a base of 3.00c on 10 gage and heavier but quote 3.25s on 14 gage and lighter. Full finished automobile sheets are unchanged at 5.35c to 5.70c, base Pittsburgh, these being the quotations of the American company and most independent producers, respectively. Demand still is as diversified as ever, backlogs of orders piling up for some of the larger makers which assure steady operations on the present basis of approximately 85 per cent for well into the third quarter.

Labor shortages still continue the outstanding handicap so that many obligations now pressing the sheet mills will be carried over.

Western Mills Well Sold

Chicago, May 29.—Sheet users in the West have not covered for sufficient sheets to fill their requirements for third quarter and some business is going to eastern mills to make up the deficiency. Prices are strong at 3.00c for blue annealed, 3.85c for black, and 5.00c, Pittsburgh, for galvanized. Premiums formerly exacted for prompt delivery seem to have disappeared, indicating the easier position of mills in the valleys. This condition has not extended to Chicago makers, who have more demand than they have been able to fill.

Steady Consumption Indicated

Philadelphia, May 29.—A large amount of third quarter sheet business now is on the books of makers in this district and there are indications from bookings that consumers expect to use fully as much tonnage in the third quarter as in the second. While considerable blue annealed tonnage has been placed for nearby and third quarter at 3.00c, base Pittsburgh, a large portion also went at 3.25c. The major portion of black sheets went at 3.85c, the 3.75c price applying only to a little June shipment, and in very few cases to the third quarter. Some galvanized tonnage for third quarter was booked at 5.25c, but the major portion went at 5.00c.

The state of Pennsylvania is in the market for 920 tons of one-pass, cold pickled sheets for automobile number plates.

Readjust Southern Rates

Birmingham, Ala, May 28.—Freight rates on steel products, including structural steel from Pittsburgh, Chicago and other northern centers to Birmingham and Atlanta have been reduced, whereas they have been increased to Memphis, New Orleans, Mobile and Pensacola, just made by the railroads Heretofore, the rate to Birmingham has been in excess of that to a further destination. The interstate commerce commission will review the proposed realignment of rates. The reduction from Pittsburgh to Birmingham will be $2.20 per ton, and to Atlanta, $2.50, while the gulf port rates will be raised $3.10 per ton and to Memphis $3.50.

Structural Awards Small

High Construction Costs and Labor Uncertainties Continue To Cause Postponement of Building—Awards Mostly for Small Tonnages

STRUCTURAL SHAPE PRICES, PAGE 1575

New York, May 29.—Unsettled labor conditions are restricting the demand for structural shapes and with few exception orders being placed are small. While a fair amount of inquiry continues to be brought up for figures, a number of projects are being temporarily held up in hopes of decreasing construction costs. Shapes and erected material prices are virtually unchanged, with the former holding around 2.50c, base Pittsburgh, with mill deliveries of two to three months. Leading local fabricators are quoting deliveries of from three to four months.

Shape Business Somewhat Larger

Philadelphia, May 29.—Miscellaneous structural shape business was somewhat larger during the past week than in weeks previous, but new bookings continue less than shipments. Premiums continue to disappear and nearby shipments now are obtained easily at 2.50c, base Pittsburgh. Occasional lots still are being done at a higher figure, particularly on shipments to the West, on which the prevailing price now is 2.60c, base eastern mill. Less new structural work is coming out. It is expected that the 1000 tons required for the new Eddystone plant of the Baldwin Locomotive Works will be placed this week. Some other industrial plant tonnage also is expected to be placed shortly. Prices on fabricated steel have declined about 10 per cent from the recent level.

Third Quarter at 2.70c

Chicago, May 29.—Although lettings of structural material for the past week have been less than the recent average in this market, it is attributed to a natural lull after much buying and also to some hesitation on the part of general contractors to undertake further work with a strike threat overhanging them in the building trades. Announcement today that differences have been adjusted and the strike averted should do much to remedy the condition. Shapes for third quarter delivery have been sold recently at 2.70c, Chicago mill, the tonnage being moderate. Delivery is the important factor and the price seems satisfactory to the buyer. For delivery at convenience the market is still 2.60c, Chicago.

Increase Building Height

Boston, May 29.—Governor Cox has signed the bill increasing the building height limit in Boston from 125 feet to 155 feet. In anticipation of this many of the business blocks in process of building have prepared plans for the additional three stories, and have placed tentative contracts for steel which now become effective. Notable among these are the First National Bank building, the Chamber of Commerce building, and the Post Office Square building, each of which contracted simultaneously with the signing of the bill for approximately 500 tons of additional steel. Fabricators throughout New England have noticed a change in the market within the last few days. The buying apathy of two weeks ago has been broken. Both inquiry and orders are much improved. Prices are holding firm at 2.50c, Pittsburgh.

No Awards of Note

Pittsburgh, May 29.—Recent structural shape awards are not noteworthy from a tonnage standpoint, many projects being held up on account of high costs. These high costs, however, are due to workmen's wages in the building trades, rather than to high costs of steel, since structural shapes now can be obtained at 2.50c, base Pittsburgh, some contracts for third quarter being accepted on that basis, and others being taken with that price applying only insofar as July shipments are concerned. The remainder will be billed at prices prevailing at the time specifications come in. Shapes for prompt delivery carry prices as high as 2.60c, base Pittsburgh or in some cases f.o.b. mill, but no orders have recently been noted at that level. Practically all fabricators in the district report the receipt of small awards, involving from 50 to 100 tons each. Labor still is short both in mills and in fabricating shops; the latter maintaining an average operation of between 80 and 85 per cent, while the mills are on a somewhat higher basis.

Shape Inquiry Larger

Cleveland, May 29.—Lettings of structural shape tonnage during the past week reflected the same dullness characterizing the market of previous weeks although the new inquiry brought out is an indication of a return of buying. Bids were asked on a building for the Knights of Columbus, at Rochester, N. Y., on either or both a 12-story structure requiring 2300 tons of shapes or a 5-story building needing 1800 tons. A 10-story hotel in Jamestown, N. Y., was also brought up for structural steel bids, although designed for reinforced concrete. Of primary interest was the opening of bids on the new public library building for Cleveland, May 28. Crowell & Little Construction Co. was low bidder on this job requiring 2200 tons of shapes and 300 tons of concrete bars. Shape prices continue firm at 2.50c, base Pittsburgh, for delivery at mill's convenience.

STRUCTURAL CONTRACTS PLACED

Building awards this week ..... 7,442 tons
Building awards last week .....13,744 tons
Building awards two weeks ago.. 8,027 tons

1400 tons, plant addition for Railway Steel Spring Co., Latrobe, Pa., to McClintic-Marshall Co.
1050 tons, loft building at 251 West Thirty-sixth street, New York, to Hinkle Iron Co.
1000 tons, high school at New Haven, Conn., to American Bridge Co.
700 tons, powerhouse for Northern States Power Co., Minneapolis, to Minneapolis Steel & Machinery Co.
500 tons, heating plant for Allegheny County Steam Heating Co., to Massillon Bridge & Structural Co.
350 tons, garage, Brooklyn, N. Y., to A. E. Norton Co.
350 tons, apartment building, New York, to Paterson Bridge Co.
300 tons, bridge runway at Illinois plant of American Car & Foundry Co., to Mississippi Valley Structural Steel Co.
250 tons, brake house and coal conveyor supports for Public Service Co. of Northern Illinois, Joliet, Ill., to Vierling Steel Co.
250 tons, thawing out plant for Philadelphia & Reading railroad, to Belmont Iron Works.
200 tons, addition to erection shop of Philadelphia company, to Belmont Iron Works.
200 tons, alterations to school No. 99, Brooklyn, to unknown fabricator.
192 tons, electrical engineering building, University of Minnesota, Minneapolis, to Minneapolis Steel & Machinery Co.
150 tons, garage at East Forty-sixth street, New York, to Easton Structural Steel Co.
125 tons, floor, plate and gallery work for the Public Service Co. of Northern Illinois, Joliet, Ill., to the Vierling Steel Co.
125 tons, floor, plates and gallery work for Waukegan Generating Co., Waukegan, Ill., to Vierling Steel Works.
100 tons, addition to Melrose telephone station, Seattle, to Hofius Steel & Equipment Co.
100 tons, garage building, Seattle, to Pacific Coast Steel Co.
100 tons, garage at Ossinning, N. Y., to McClintic-Marshall Co.

STRUCTURAL CONTRACTS PENDING

3000 tons, power plant addition to United Electric Light & Power Co., East St. Louis, Ill.; pending.
2300 tons, 12-story building for Knights of Columbus, Rochester, N. Y.; bids in. Bids also in on 1800 tons for 5-story structure alternate proposition.
2200 tons, public library building, Cleveland, revised from 4000 tons; Crowell & Little Construction Co. awarded general contract.
1000 tons, Hamilton hotel, Paterson, N. J.; pending.
850 tons, building for American Piano Co., New York; pending.
750 tons, transfer bridges for Lehigh Valley railroad; pending.
700 tons, sub-station for Edison Electric Co., Carver street, Boston; bids being taken.
500 tons, foundry for Hunt Spiller Mfg. Co., South Boston, bids being taken.
500 tons, power house at Pineville, Ky.; pending.
500 tons, work for Public Service Corp., Newark, N. J.; pending.
400 tons, station for Illinois Central railroad, Champaign, ...; pending.
350 tons, addition to power plant at Grand Tower, Ill.; pending.
300 tons, repair shops for American Locomotive Co.
200 tons, bridge material for Northern Pacific railroad; pending.
148 tons, bridge at La Grande, Ore., bids opened by highway commission May 28.
100 tons, Moses Cleveland school, Cleveland; bids to be asked soon.
100 tons, Paul Revere school, Cleveland; bids asked.
Tonnage not stated, Hotel Jamestown, Jamestown, N. Y., 10-story building, designed for reinforced concrete; bids in June 11.
Tonnage not stated, transmission towers for Sixth avenue northeast, Seattle; bids open June 1, and transmission towers for Skagit river development; bids open June 8.

Sheet Manufacturers Take Optimistic Outlook

Cleveland, May 29.—Despite the pessimistic talk of the last few weeks, the steel sheet manufacturers and distributors attending the semi-annual meeting of the metal branch of the National Harware association at Cleveland, May 25 and 26, expressed an optimistic outlook for the continuation of good business. W. H. Donlevy, of Philadelphia, presided at the two day session.

Walter C. Carroll, vice president in charge of sheet sales for Inland Steel Co., Chicago, in his address, stated his conviction that the present lull in business has afforded both manufacturer and buyer an opportunity for self-analysis, with the result that few companies are tending to overexpansion, overproduction and the other evils which resulted in the 1921 depression. Edward S. Jordan, president of the Jordan Motor Co., Cleveland, spoke on "General Business Conditions," and also observed that a tendency to conservatism at this time would result in great prosperity in the future.

W. E. Scott, Youngstown Sheet & Tube Co., stated that it was likely that the

mills will continue operations throughout the year because of their well-booked condition. Others to address the sheet manufacturers and distributors were, C. L. Patterson, of the National Association of Sheet and Tin Plate manufacturers, Pittsburgh; F. O. Shoedinger, Columbus; H. H. Taylor, Philadelphia; John A. Penton, president of the Penton Publishing Co., Cleveland, and George H. Charles, vice president and general manager of the United Alloy Steel Corp., Canton, O.

Conservatism in progressing now would be beneficial to all ,in the belief of those who addressed the sessions of the semi-annual meeting. This thought was brought out by Mr. Jordan who concluded his address with this observation: "Keep on with a definite, logical production—don't run your business in fits and spurts, and you will gain in 1924 what you pay out in 1923." In commenting on the condition of the mills, Mr. Scott said, "Sheet mill books are generally well filled for the second quarter and bookings in some cases extend well into the third quarter. Mills are not being operated to full capacity on account of the shortage of labor. There has been some slight decrease in the tonnage required during the past couple of weeks, but this decrease is more than offset by the decrease in production."

To Build Refrigerators

The Zanesville Engineering and Refrigerating Co. Zanesville, O. will begin the manufacture of commerical refrigerating machines on June 15 at the plant here. This announcement was made this week at a meeting of the stockholders at which time the organization of the company was perfected and its capital stock increased from $200,000 to $250,000. Directors of the company were elected as follows: John F. Brown, L. H. Wise, C. W. Albertson, J. N. Palmer, J. A. Kaplan, Frank M. Ransbzottom, H. C. Van Voorhis, W. M. Bateman, E. F. O. Neal, A. P. Rogge and Mannie Levi. The following officers were elected: F. Brown, president; L. H. Wise, vice president; J. N. Palmer, secretary and general manager, C. W. Albertson, treasurer and J. A. Kaplan, plant superintendent.

Ore Shipments Heavy

ORE PRICES, PAGE 1636

Duluth, May 29.—Ore mining companies are operating to capacity. Mines on the Minnesota ranges are enlarging crews and labor conditions appear satisfactory. Thirty-six cargoes of ore were loaded at Duluth and Superior docks in the past two days. Loading is being rapidly done.

To Deal in Machinery

H. E. Cyphers has organized the H. E. Cyphers Co., Kinney building, Newark, N. J., to deal in machine tools and other equipment. Mr. Cyphers, who is president, was formerly associated with the Sun Machinery Co., also of Newark.

Graphite Sales Increase

Washington, May 29.—Sales of crystalline graphite in 1922 gained approximately 56 per cent over those of 1921 according to figures of the geological survey department of the interior. Total sales in 1922 were 1,849,776 pounds, valued at $85,242.

Place More 1924 Rails

Car Buying Continues Moderate—Few Large Inquiries for Track Materials—Southern Railway Places 33,000 Tons Second Half Rails

RAILROAD TRACK MATERIAL PRICES, PAGE 1575

New York, May 29.—New York Central railroad opened bids May 25 on 175,000 tons of rails for the second half requirements of its entire system. The Pennsylvania railroad now practically has decided to buy 15,000 tons only of rails for the second half. The Philadelphia & Reading railroad practically has decided to place 15,000 tons for the second half. All of this business is expected to go at $43 base mill. Three companies will supply the 33,000 tons of steel rails for last half delivery recently placed by the Southern Railway system. The largest share, o. 23,000 tons, of the business went to the Tennessee Coal, Iron & Railroad Co., while the others participating in the order were Bethlehem Steel Co., with 8000 tons ordered and Illinois Steel Co. with 2000 tons.

Railroad car buying in this district continues light the month now closing being by far the least active this year. There is little demand in prospect for the near future. Locomotive buying was limited to five switch engines for the New York, New Haven & Hartford, the order going to the American Locomotive Co. The Union railroad is inquiring for 15 switch engines and the Baldwin Locomotive Works has booked an order for 30 locomotives for the Atchison Topeka & Santa Fe railroad.

Business Not Voluminous

Pittsburgh, May 29.—Volume is not present in the light rail market, although small orders continue to be received from time to time. Larger orders are pushed further into the future by the shutting down of more coal mines. The usual orders are for one to three carloads at a time except when light rails are bought for several mining operations under one buying head. The price remains where it has been for several months past, 2.25c, base Pittsburgh.

One or two representative railroads are in the market with large inquiries for standard spikes and tie plates. These include the Pennsylvania, which wants 500,000 tie plates and 20,000 kegs of spikes. One other railroad as yet unidentified wants a similar large quantity. Railroads apparently are making money and the spike makers believe it will be their policy to spend it on equipment and track maintenance so that they are encouraged over the prospects of good business to come for many months. Some of the requirements up for consideration run into the third quarter; others are for June. Prices of railroad track material are unchanged.

Rails Placed for 1924

Chicago, May 29.—Placing of standard steel rails continues in a moderate way, with full knowledge that they cannot be delivered until 1924. The fact that mills are willing to accept this business indicates no change will be made in price for next year. Track fastenings also are in demand in moderate lots. Car buying is slow and probably will not pick up until late in the year when builders have less business on their order books. To keep up to the average, at least 80,000 cars should be bought in the remainder of this year. This would mean about 800,000 tons of steel for their construction.

CAR ORDERS PLACED

Florida East Coast railroad, 15 baggage cars, two mail cars and one dining car, to Pullman Co.

Sinclair Refining Co., 15 tank cars to Standard Tank Car Co.

Atlantic Coast Line railroad, 25 passenger coaches, 25 combination mail and baggage cars, to Osgood Bradley Car Co., of the Standard Steel Car Co.

Florida East Coast railroad, 200 underframes, 10 cabooses, to Mt. Vernon Car Mfg. Co.; 1 diner, 2 mail cars and 15 baggage to Pullman Co.

Missouri Pacific railroad, 25 passenger cars, to American Car & Foundry Co.

New Haven Gas Light Co., two tank cars, to Standard Steel Car Co.

CAR ORDERS PENDING

Kansas City Southern railroad, 500 box cars; pending.

Pacific Electric railway, 50 passenger cars; bids asked.

Illinois Traction System, 100 box cars, 100 coal cars; pending.

Southern Pacific railroad, 50 stock cars; pending.

Standard Oil Co., 10 coke cars; pending.

Chicago & Illinois Western, 30 passenger cars; pending.

Atchison, Topeka & Santa Fe railroad, four private cars; pending.

Plant Is Dismantled

Detroit, May 29.—The fabricating plant of the American Bridge Co., in this city is being dismantled as fast as conditions will permit and the machinery is being shipped to other parts of the country. Action of officials is said to be due to the unstable conditions of the labor market at this point. J. H. Munn, manager of the Detroit branch of the company says the company will maintain an office here and look after construction work now being carried on as well as to bid on future work.

Receiver Appointed

Judge Fairchild of the Milwaukee circuit court has appointed Edward L. Cullen, 2923 Cedar street, receiver for the Hercules Steel Casting Co., 871-881 Robinson avenue, in response to the petition of Walter Landwehr, vice president of the company. He says the assets are $350,000, and the liabilities $150,000, including $14,000 due employes. The company makes electric steel castings and has been operating since 1918. Mr. Landwehr says the company should be able to liquidate all indebtedness.

To Build Lead Pipe Plant

William A. Burr, Monterey, Mexico, and associates are arranging to construct a plant for the manufacture of lead pipe. The company which is being organized with a capital of $100,000, will have a plant with a daily capacity of 10 tons. The plant will be located at San Antonio Tex. The plant will use lead bullion from Mexican mines.

The Nonferrous Metals

Buying Movement Of Metals Thus Far Fails To Materialize As Manufacturers Are Well Covered

	Copper—Electro delivered	Copper—Lake delivered	Spot Straits New York	Lead† New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel spot
May 23.....	15.50	15.75	42.12½	7.30	6.60	26.50	7.25	29.00
May 24.....	15.40	15.75	42.50	7.30	6.50	26.50	7.25	29.00
May 25.....	15.37½	15.75	42.00	7.30	6.40	26.50	7.12½	29.00
May 28.....	15.20	15.30	41.70	7.27½	6.40	26.50	7.12½	29.00

†Outside market quotation.

NEW YORK, May 29.—Metals are weak again. A week ago it looked as if a turning point had come, but the buying movement died in its infancy and producers of copper and zinc are either bidding for business or out of the market and leaving it to those who want to sell at the lower levels. Tin is erratic; aluminum shows little change, while lead is the one metal of strength.

Several factors are prominent in the slump, general uncertainty on domestic business in the summer being the leader. To add to this drawback is the almost absolute certainty that Europe will not be able to enter the market here on any considerable scale for a long time. Moreover, manufacturers appear to be well covered for immediate needs.

In the meantime, output of metals is continuing at a good rate, but it is said that harvest season, soon to start in the Southwest, will bring a reduction in output because of the miners and smeltermen as usual going into outdoor work. In the East the refining works also have trouble holdiing their workmen.

Zinc generally is the metal most affected by the summer labor situation. However, output at present is at an unusually high rate and last month the shipments were even larger than output, but this strong statistical condition has not been sufficient to hold the market in the face of contracts expiring this month and in June and users not contracting ahead.

Tin has fluctuated from 43c to less than 42c, then to 42.50c and off again, with business good some days and poor on others, but tin plate mills have bought little. They have been getting good supplies on contract, but as plate is well sold for the third quarter it is thought they will have to enter the market within another month for futures. Spot Straits is stronger with stocks diminishing.

Copper sold up to 15.62½c, delivered, but now is obtainable at 15.37½c from some producers, while the outside market, which has been relatively firm in the past few days with not much metal to offer, is 15.25c, refinery. Lake sold a week ago at 15.75c, delivered, but has been inactive since then.

The political situation in Europe has had something to do with the weak market in London and that is one of the causes of buying being held off here. Brass mills are well booked but have taken on little new business the past few weeks, but some copper wire has been sold in addition to the big bookings. A few holdups of brass mill products also are heard. Casting copper can be bought at 15.00c to 15.25c refinery, with most large smelters asking the latter figure as they are well booked.

Buying of lead has been fair, mostly for June and a little for July. The London market, unlike the market there in other metals, has been relatively strong so that not much has been offered for import in the past month.

Aluminum sales in the open market are few and far between, but foundries are fairly well taken care of on contracts.

The Allis-Chalmers Mfg. Co., Milwaukee, had unfilled orders on May 1 amounting to $11,570,000 compared with $9,900,000 on April 1 and $8,215,000 on Jan. 1. Bookings have exceeded billings each month this year.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled, 24 oz., min.	24.25
High brass	20.50
Zinc, ga. 9 to 18 (plates ½c less)	9.20
Lead, full sheets (cut ¼c more)	10.75
Aluminum, base 18 ga. and up...	35.40
SEAMLESS TUBES	
High brass	25.50
Copper	27.00
RODS	
High brass, round, ⅜ to 2½ inch	18.75
Naval brass rod	21.00
WIRE	
Copper	19.00 to 19.50
High brass	22.25

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	10.00 to 10.50
New York	10.00 to 10.50
Chicago	9.50
HEAVY YELLOW BRASS	
New York	7.00 to 7.50
Chicago	7.00
Cleveland	7.00 to 7.50
ZINC	
New York	4.25
Cleveland	3.25 to 3.75
HEAVY COPPER AND WIRE	
Cleveland	12.50 to 13.00
New York	12.50 to 13.00
Chicago	12.00
RED BRASS TURNINGS	
New York	9.00 to 9.25
Cleveland	9.00 to 9.50
Chicago	9.00
YELLOW BRASS TUBING	
Cleveland	7.00 to 7.50
NO. 1 BRASS ROD TURNINGS	
Cleveland	6.50 to 7.00
New York	7.75 to 8.00
Chicago	8.50
ALUMINUM BORINGS	
Cleveland	11.00 to 13.00

Coke Production Shows Weekly Gain

Washington, May 29.—Production of beehive coke for the week ended May 19 showed a small recovery from the decline which set in during the first two weeks of the month, according to the geological survey. On the basis of the number of cars loaded on the principal coke carriers the total output is estimated at 409,000 net tons. In comparison with the week preceding this is an increase of 8000 tons. There was an increase of 25,000 tons in the Pennsylvania-Ohio region which more than offiset small losses in the Southern and Middle Appalachian States and in Colorado and New Mexico. The estimate of weekly output follows:

	Week Ended May 19, 1923	May 12, 1923(a)	May 22, 1922
Pennsylvania and Ohio.	332,000	317,000	72,000
West Virginia	23,000	24,000	6,000
Ala., Ky., Tenn. and Ga.	22,000	28,000	8,000
Virginia	17,000	17,000	6,000
Colorado and New Mexico	8,000	9,000	4,000
Washington and Utah..	7,000	6,000	3,000
United States total....	409,000	401,000	99,000
Daily average	68,000	67,000	17,000

(a) Revised from last report.

Production of bituminous coal showed a sharp gain in the week ended May 26. The total, according to preliminary estimates, was about 10,800,000 tons, against 10,296,000 tons in the preceding week.

Valley Operating Rates Continue Unchanged

Youngstown, O., May 29.—While production has slowed down due to the scarcity of workmen and the hot weather, the rate of operations throughout this district remains unchanged. A shortage of steel continues and efforts are being made to keep open hearths engaged at capacity. Forty-nine of the 51 independent open hearths are being charged which is 96 per cent of capacity. The Youngstown Sheet & Tube Co. is operating 22 open hearths, the Republic Iron & Steel Co. 14, the Trumbull Steel Co. 7 and the Sharon Steel Hoop Co. 6.

District sheet manufacturers started the week with 98 per cent of capacity engaged. The Youngstown Sheet & Tube Co. has 42 mills under power, the Republic Iron & Steel Co. and the Newton Steel Co. 17 each, the Trumbull Steel Co. 15, the Sharon Steel Hoop Co. 9, the Falcon Steel Co. 8 and the Mahoning Valley Steel Co. 7 a total of 115 units.

While the tenth tube mill of the Youngstown Sheet & Tube Co. did not resume last week as contemplated, latest reports are that repair work will be completed this week to permit starting on production. This company has 9 pipe, 2 bar, 3 plate mills rolling and its wire, rod and bessemer departments active. The Republic Iron & Steel Co. has 7 finishing mills engaged and expects to place its 10-inch mill under power late this week; in addition 5 pipe mills are on schedule and both bessemer converters are active. The Trumbull Steel Co. is operating 19 hot tin mills at its main works and 6 at the Liberty plant while the Falcon Steel Co. has 6.

Submit Testimony in Basing Case

Salss Managers of Many Steel Companies Attend Hearings in Pittsburgh Basing Complaint—Trade Commission Has Completed Case—Independents' Sales Policies Are Outlined—Next Hearings at Pittsburgh

HEARINGS in the Pittsburgh basing point complaint of the Federal trade commission against the United States Steel Corp. were held at New York, May 17 to 25, inclusive. The hearings were conducted under Examiner John W. Bennett, with W. W. Corlett and Cordenio A. Severance as counsel for the Steel corporation, and Karly E. Steinhauer for the federal trade commission. An adjournment has been taken until the latter part of this week or early next week when further hearings will be held at the Fort Pitt hotel, Pittsburgh. Later, hearings also will be held at Chicago. Inasmuch as the federal trade commission has completed its case, the present hearings are for the compilation of the Steel corporation's defense.

Paul M. King, general sales agent, Worth Steel Co. Claymont, Del., testified that his mill could not operate at a profit in the production of tank plates if it obtained the same price at the mill as at Pittsburgh, and that this would also apply to boiler and special steels were it not for the extras. He said at times his company's delivered prices are lower than the Pittsburgh base price plus the freight to destination. He said it was the policy of the company to get the same base price net at the mill for western business as it has been securing on the average for eastern tonnage.

Charles H. Rose, auditor, Youngstown Sheet & Tube Co., and until a few months ago comptroller of the Brier Hill Steel Co., identified the statement of shipments by the Brier Hill Steel Co.

William E. Manning, vice president of the Youngstown Sheet & Tube Co., in charge of sales, testified that his company always has been a seller of semifinished steel, the selling prices of which are on the basis of f. o. b. cars at Youngstown. On finished steel products the company usually takes into consideration the competition at the point of delivery, using for convenience the freight rates from Pittsburgh or Pittsburgh equalization. Mr. Manning said that most of the company's output goes to consuming points in Ohio and Pennsylvania but that large quantities go to New York and elsewhere.

William F. Vosmer, general manager of sales of the Donner Steel Co., Buffalo, said his company distributes its output in the territory east of Buffalo and west of Buffalo as far as Michigan. The Donner company, said Mr. Vosmer, usually quotes on the Pittsburgh basis.

Charles K. Hardy Jr., sales manager of the Wickwire Spencer Steel Corp., said this company sells mainly to the northeastern section of the country but also considerable tonnage to all other parts. Mr. Hardy said his company is obtaining 25 to 50 per cent higher on shipments from its Worcester mills than it understands the Pittsburgh mills are quoting, and he explained that this statement applied to sales on an f.o.b. Pittsburgh basis. He said that condition was true only in time like the present.

G. H. Blakeley, manager of structural and plate sales, Bethlehem Steel Co., said about 17 per cent of Bethlehem's structural output goes to the Chicago district and the west. Eliminating the Pacific coast, about 12 per cent goes to the general Chicago district. Questioned as to definite sales of structurals in the Chicago district, Mr. Blakeley said he recently had sold 2200 tons to a large Chicago company for shipment from Bethlehem, and that the price was $2.60 base at the mill plus all the extras. He said the price was arrived at by quoting the Chicago price figured back to Bethlehem. Mr. Blakeley said the company has no price at Bethlehem. It meets the prices at New York, Philadelphia, Boston, etc.

Robert W. Gillispie, assistant general sales agent, Bethlehem Steel Co., testified that he has charge of all commerical products other than plates and shapes. Roughly, Bethlehem has about 150 salesmen in this general field. He said some sales are made f. o. b. mill, some f. o. b. mill with freight allowed to destination and some f. o. b. Pittsburgh basis with Pittsburgh freight added and actual freight from mill to destination allowed. The salesmen have what might be termed a current asking price and if there is anything out of the ordinary as to tonnage, sizes, deliveries, reference is made to the home office for instructions. Mr. Gillispie said that since Bethlehem took over Lackawanna it sells bars in Buffalo at a lower price than the Pittsburgh base plus freight.

Harry L. Rownd, first vice president of the Republic Iron & Steel Co., testified that his company sold most of its output in a territory having a radius of 200 miles from Youngstown. Some products, like sheets, had a wider distribution than others. Mr. Rownd said considerable tonnage was sold in the Chicago-St. Louis territory. He said his company's quotations were on a Pittsburgh basis.

Frank H. Gordon, general manager of sales, Lukens Steel Co., Coatesville, Pa., said the product of his company is distributed mostly in the east but it also ships it to Chicago, the South, the Pacific coast and other parts of the country. Mr. Gordon fixes all prices in consultation with the president of the company. He said that in arriving at his prices he started with a Pittsburgh base and figured what that nets at the mill.

John C. Neale, president of the American Stainless Steel Co., testified that he was vice president and general manager of sales of the Midvale Steel & Ordnance Co. He said that in this capacity he was practically in absolute control of prices. He said he realized that the district men had more general knowledge of the conditions they had to meet locally so that he tried to give them as much authority, probably more authority, than any other steel company in the country gave its men. Speaking of premium prices, Mr. Neale said he sold plates as high as 13 cents a pound while he did not think the Steel Corporation ever obtained more than 3½ to 4 cents. Mr. Neale said he never tried to get all of any one customer's business. He said he had one such customer and told him he wished he would keep out of his office since he was more trouble than he was worth because the Midvale company had to give him tonnage that it wanted to sell elsewhere. Almost invariably Midvale quoted delivered prices. Only a few were on a mill basis. Mr. Neale would not admit that the starting point in building up prices was Pittsburgh. He said he quoted prices based on competition at the destination. During 1921, said Mr. Neale, his company obtained a great deal of business because of favorable milling in transit rates. Mr. Neale explained his sales policy with Midvale. He said that when he saw his order books getting towards four months ahead he began to pull in his salesmen so that he could take advantage of the rising market. He said that policy had been quite prevalent among the independents for the last two or three years.

Among others who submitted statements were James H. Kessack, statistician, Bethlehem Steel Co.; James C. Jones, president, Cleveland Steel Co.; Austin T. Hunt, manager of sales, Seneca Iron & Steel Co., Buffalo; George W. Connors, president, Connors Steel Co., Birmingham; Walter M. Wells, chief accountant, John A. Roebling's Sons Co., Trenton, N. J.; Frederick Connell, manager of sales of the manufacturing trade department, American Steel & Wire Co., New York; and Harold L. Stevens, general manager of sales, Central Iron & Steel Co., Harrisburg, Pa.

Cloud Lifts from Trade Sentiment

Judge Gary's Address Helps To Swing View of Outlook Away from Growing Pessimism—Soundness of Basic Factor Becoming More Apparent—Credit Position Encouraging—No Advance in Rediscount Rates

BY JOHN W. HILL, FINANCIAL EDITOR

A CLOUD is lifting from financial and business sentiment. Its going has been greatly speeded by the ringing words of faith in the outlook uttered by Chairman E. H. Gary of the United States Steel Corp., before the American Iron & Steel institute. Growing appreciation of the underlying soundness of conditions has been reflected in the stock market recovery and the firmness of numerous commodities.

The hallmarks of an extended trade reversal are not to be found in the factors controlling the present outlook. Credit is abundant. The consumption of goods is enormous. The purchasing power of wages is 28 per cent greater than 1914. Price inflation has been checked and business conservatism prevails. Inventories are not excessive and plant expansions are being held within bounds. Freight movements are breaking all records for this time of the year, railroad earnings are expanding and the roads have a vast program of improvement under way.

The recent spread of business caution has been a constructive event of great significance. Two months ago dangerous tendencies were developing. Prices were soaring and wages were rising. Overbuying and duplicate orders were appearing. These were the things which in 1920 led to the credit strain, the piling up of high priced inventories, cancellations and finally industrial collapse. The refusal of business men to place large future orders, when order books of many large companies were already overflowing, has permitted the ship of business to keep its equilibrium. Good times should be prolonged as a result.

The federal reserve board finds "basic conditions sound and satisfactory" and rediscount rates will not be advanced. There is nothing in the position of the federal reserve system to justify higher rates. A few months ago it appeared that the board would have to lift the credit barriers purely as a precautionary measure. Compared with 1920 the condition of the reserve system is immeasurarely sounder. As shown by the Business Trend chart the cash ratio of the system is now around 75.5 per cent. This is an increase of 82 per cent over May, 1920.

Gold reserves have increased 59 per cent since May, 1920; total bills on hand of the system are 66 per cent less; and federal reserve note circulation is 24 per cent less. Money rates have been easier recently, due to the lull in trade and prices. As a result commercial loans are less.

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The Barometer of Business

WEEKLY COMPARISON

	Last week	Week befroe	One mo. ago	One year ago	Average 1913
Business failures	355	351	385	451	328
Cash ratio Fed. Res. System	75.6	75.3	77	77.5	...
Loan rate, 4-6 Mo. N. Y. (per cent)	5	5-5¼	5¼-5½	4¼	5¼
Aver. 25 ind'l shares	$109.92	$106.64	$112.29	$98.80	$58.19
Aver. 25 rail shares	$61.38	$60.38	$62.80	$62.76	$82.97
Ave. 40 bonds	$78.06	$77.56	$77.18	$80.14	$93.00
Car loadings (week ended May 12)	974,531	961,029	946,759	767,094	*843,155
Bank debits 241 cities (000 omitted)	$9,608,989	10,191,772	$9,452,811	$9,027,657	.....

*1920.

FOREIGN EXCHANGE (Demand)

	Normal	(close) May 26	before Week	Mo. ago	Yr. ago
Sterling	$4.86	$4.62	$4.62	$4.64	$4.44
Francs	19.3c	6.61c	6.66c	6.78c	9.11c
Lira	19.3c	4.78c	4.85c	4.92c	5.24c
Marks	23.8c	0.0017c	0.0020c	0.0033c	0.35c

MONTHLY COMPARISON

	April	Month before	Year ago	Monthly average 1913
Dodge building awards in 27 states	$358,693,000	$334,000,000	$353,162,000	$71,450,000
Business failures:				
Number	1520	1682	2167	1336
Liabilities	$46,991,941	$48,393,138	$73,058,637	$22,723,000
Exports	$340,970,000	$341,162,000	$329,979,000	$207,000,000
Excess of gold imports	$8,533,235	$5,559,257	$10,664,000	†$630,716
Bureau of Labor Price Index	159	159	143	100
Bradstreet's Price Index	147.8	150.1	126.6	100
Economist's British Price Index	4440	4392	4285	2717
Cost of Living Index	159.1	159.2	154.8	100
New incorporations	$1,006,258,000	$500,819,000	$792,373,000	$172,301,000
Railroad net earnings	*$83,568,000	$38,903,000	$83,511,000	$59,900,000

*March. †Monthly average excess exports.

The Business Trend

May 31, 1923

TRADE TODAY, TOLD BY IRON TRADE REVIEW CHARTS

GENERAL SITUATION—Business and financial sentiment turns more cheerful as securities stiffen and many commodities reverse recent decline; basic conditions described as sound by federal reserve board; speculative accumulation of commodities at minimum.

CREDIT SITUATION — Federal reserve board and its advisers decide to leave rediscount rates unchanged; lack of credit inflation and business conservatism keeps finances healthy.

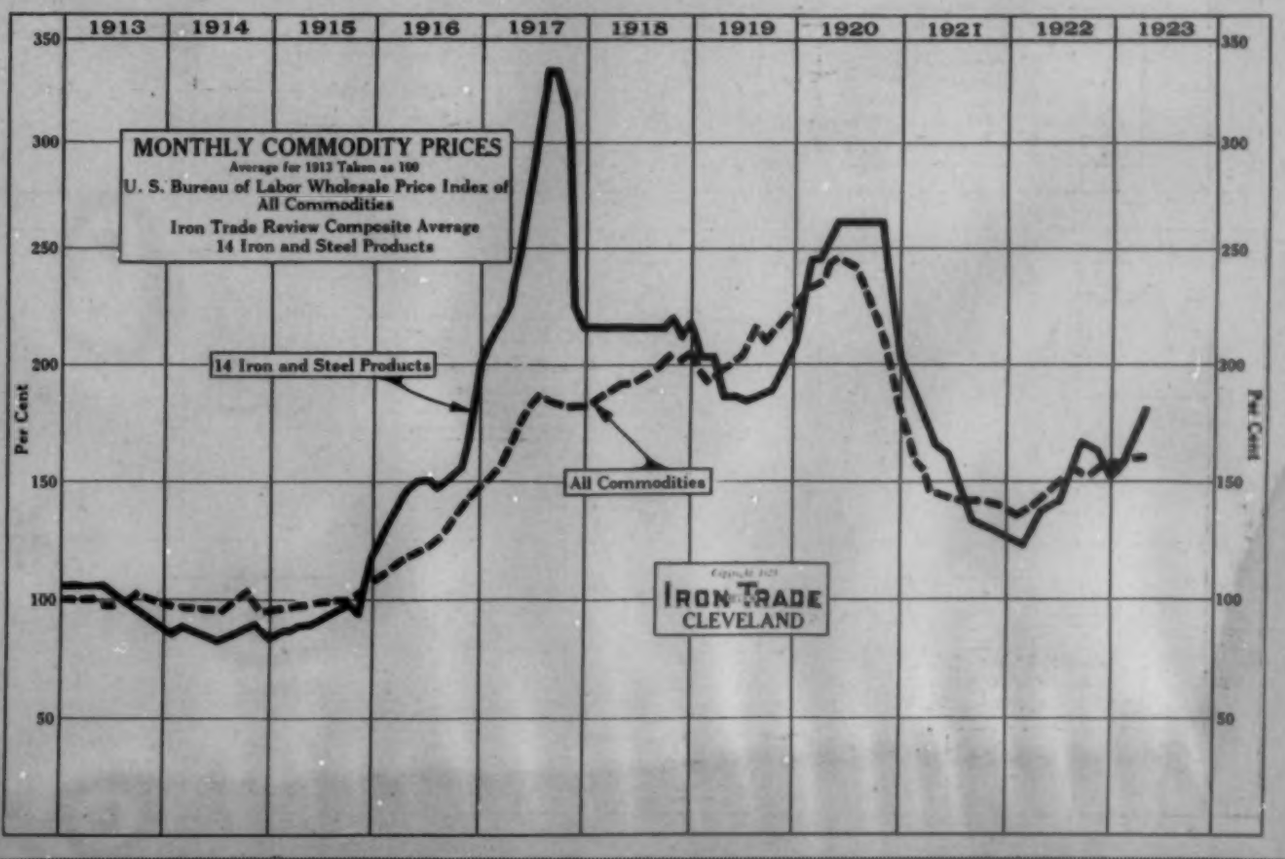
SECURITIES—Stocks show improving tendency following prolonged reaction from March high level; bonds stronger as money ease grows and investment funds accumulate.

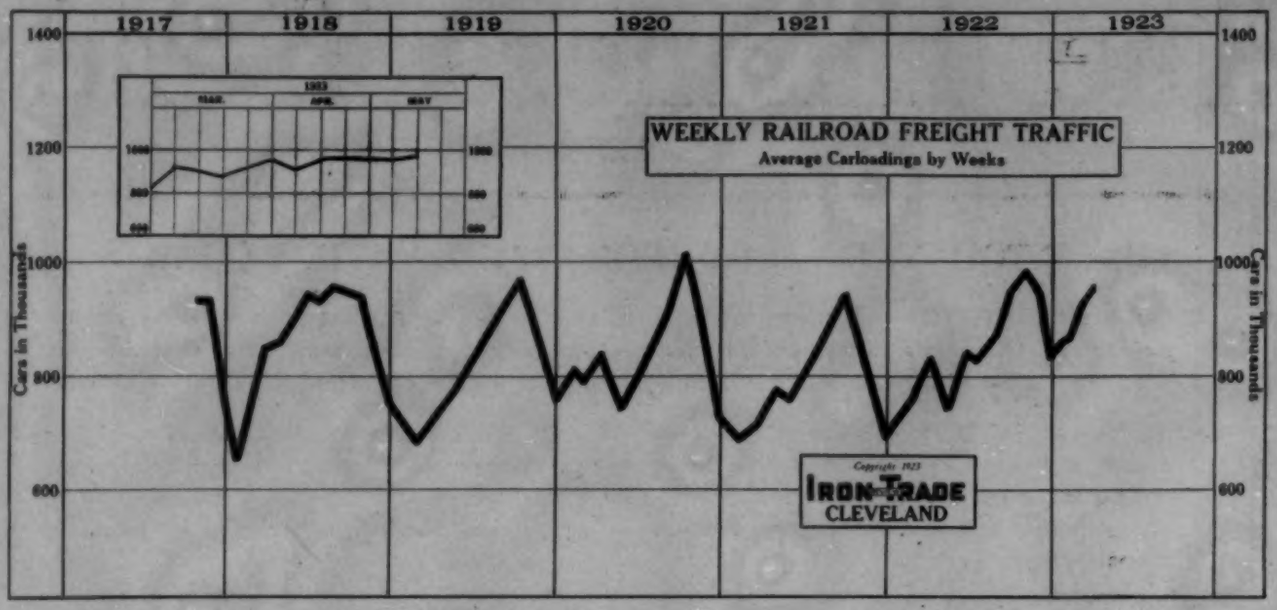
FREIGHT TRAFFIC—Car loadings for second week of May cancel decline of preceding week; total of 974,531 cars within 4 per cent of last Autumn record; 8 per cent over previous peak for the week in 1918.

WHOLESALE PRICES—Bureau of labor statistics index gains less than 2 per cent this year; now 59 per cent over 1913; iron and steel price average 80 per cent over 1913.

LIVING COST—Dollar's purchasing power, compared with 1914, now 62.2 cents; was 64.6 cents one year ago and 48.9 cents at 1920 peak; living cost index moves little in recent months.

STRUCTURAL AWARDS—Contraction of construction program reflected in smaller structural steel awards in April; bookings were 80 per cent of capacity, against 96 per cent in March.




1917
1918
1919
1920
1921
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1400
1200
1000
800
600
Cars in Thousands
WEEKLY RAILROAD FREIGHT TRAFFIC
Average Carloadings by Weeks
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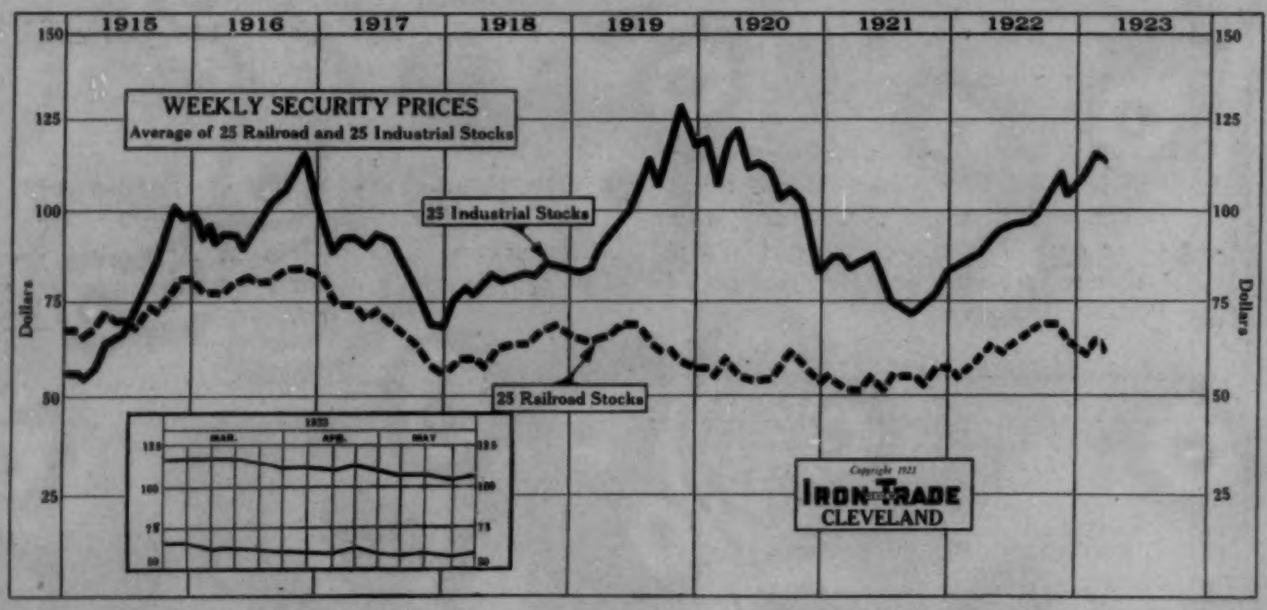
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Dollars
WEEKLY SECURITY PRICES
Average of 25 Railroad and 25 Industrial Stocks
25 Industrial Stocks
25 Railroad Stocks
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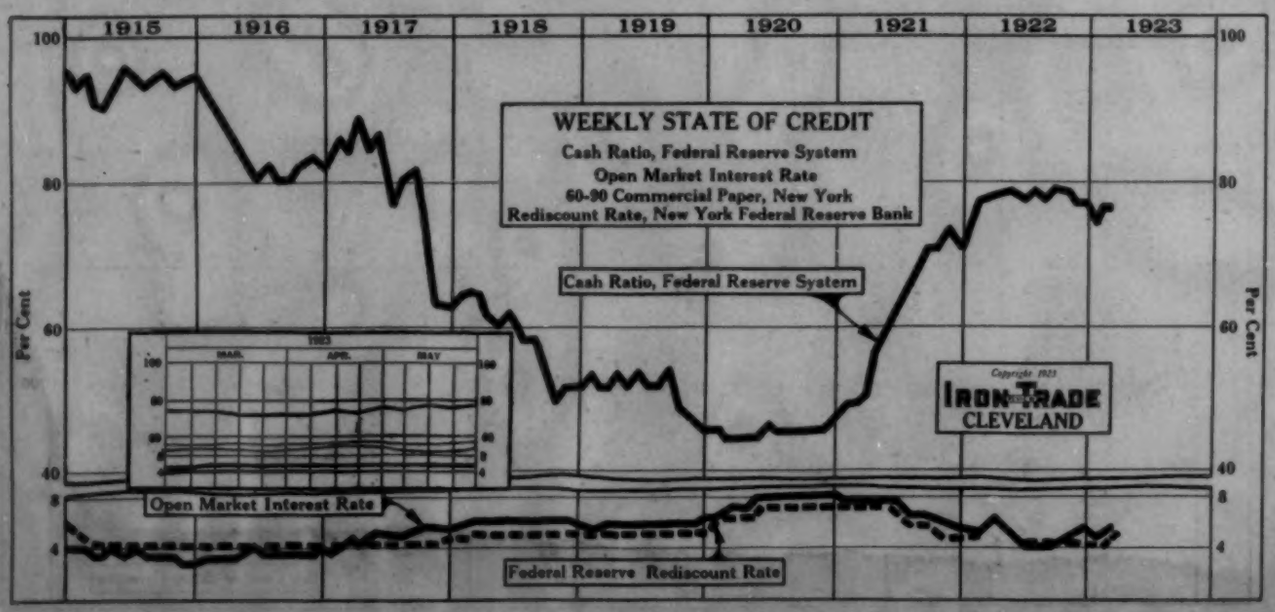
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Per Cent
WEEKLY STATE OF CREDIT
Cash Ratio, Federal Reserve System
Open Market Interest Rate
60-90 Commercial Paper, New York
Rediscount Rate, New York Federal Reserve Bank
Cash Ratio, Federal Reserve System
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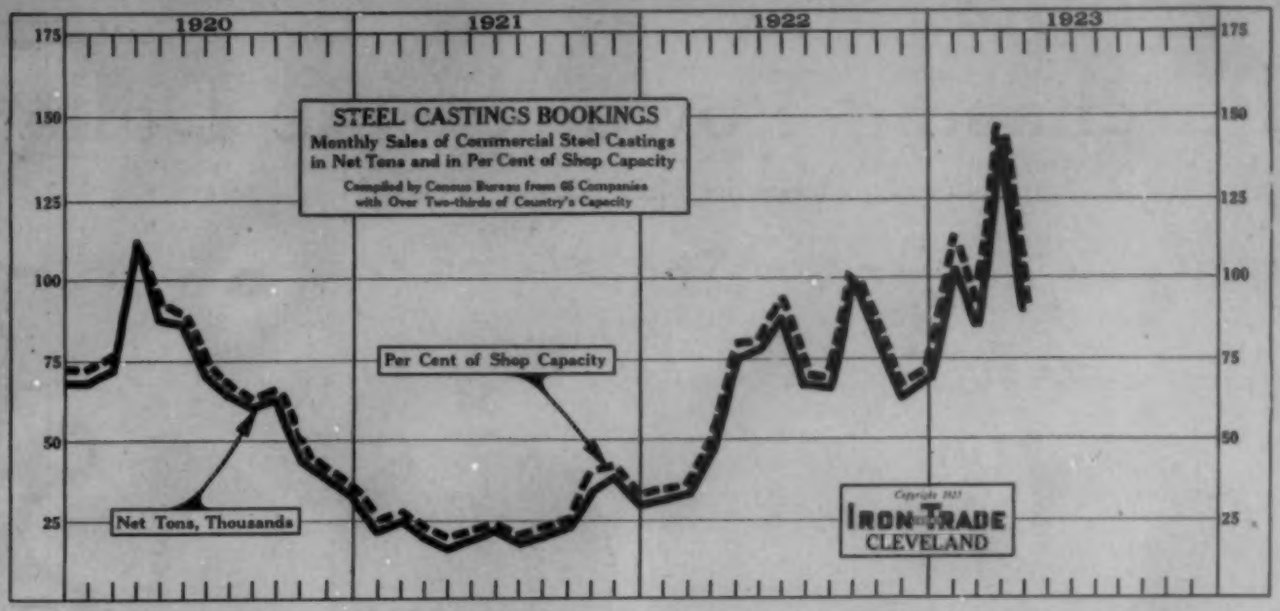
Open Market Interest Rate
Federal Reserve Rediscount Rate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STEEL CASTINGS BOOKINGS
Monthly Sales of Commercial Steel Castings in Net Tons and in Per Cent of Shop Capacity
Compiled by Census Bureau from 65 Companies with Over Two-thirds of Country's Capacity
Per Cent of Shop Capacity
Net Tons, Thousands
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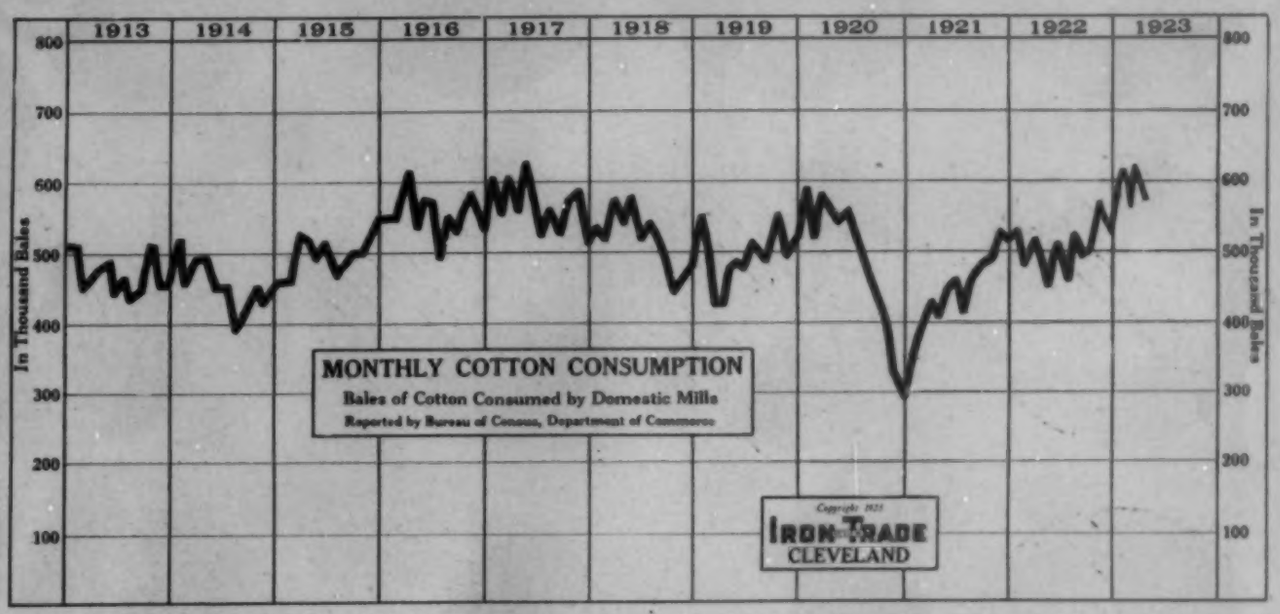
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In Thousand Bales
MONTHLY COTTON CONSUMPTION
Bales of Cotton Consumed by Domestic Mills
Reported by Bureau of Census, Department of Commerce
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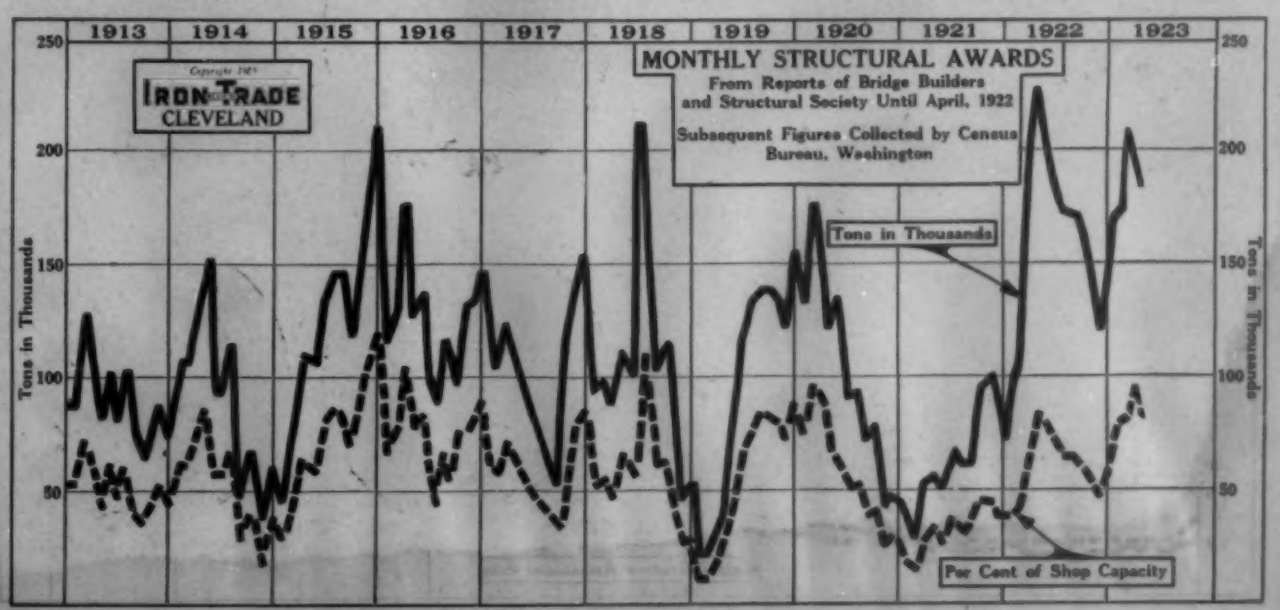
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Tons in Thousands
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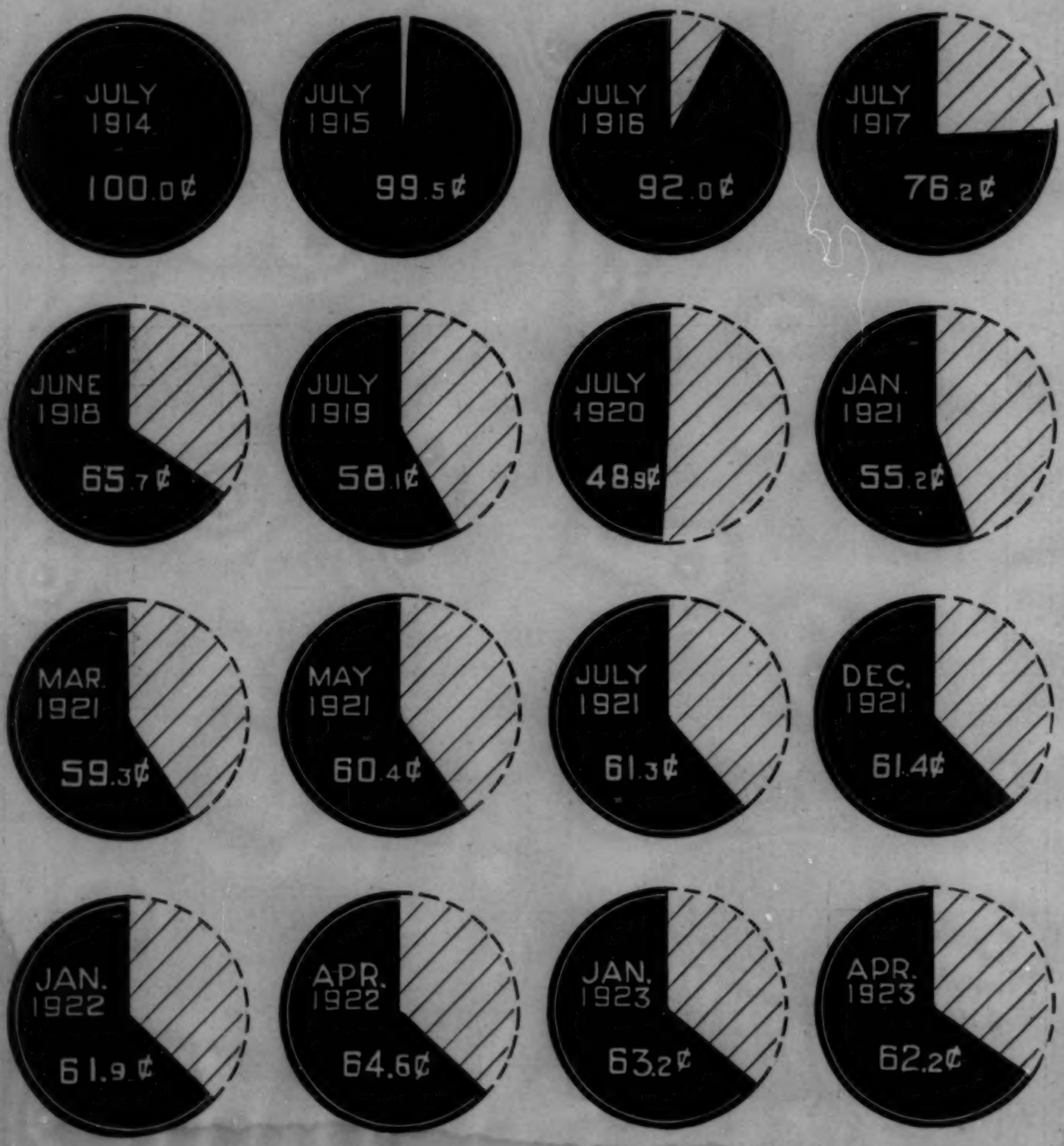
MONTHLY STRUCTURAL AWARDS
From Reports of Bridge Builders and Structural Society Until April, 1922
Subsequent Figures Collected by Census Bureau, Washington
Tons in Thousands
Per Cent of Shop Capacity

Purchasing Power of the Dollar

Showing Fluctuations from 1914 to Present Time

Based on Cost of Living

Retail Prices



British Steel Market Is Firmer

Pig Iron Continues To Soften, Scotch No. 3 Down to $26.62—Ferro Lower in Response to Easier American Market—United States Coke Producers Cut Prices, but Fail To Attract—Outflow of Ruhr Material Is Slow

Iron Trade Review Staff Cable

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, May 28.—Renewed inquiry for around 8000 tons of American coke has not resulted in orders, although the price offered has been $2.50 under that which applied on previous sales. The market for ferromanganese reflects the reaction of American buyers, bringing about the lower export quotation £20 ($92.60) now being named. The Belgians are the only continental buyers of British ferromanganese at present.

Mutual concessions for the release of steel from the Ruhr district have not been productive of results so far, as only a few barge loads have been shipped. A larger movement is expected later. The leading London merchants who have purchased Ruhr steel heavily for re-export to South America and the Far East are not anxious for a too rapid an outward movement.

Belgian activities are hampered by the railroad strike there. The miners' strike in the Saar has been settled. Production of pig iron in France still is only 60 per cent of that before the Ruhr occupation.

Although the British market for finished steel is firmer, pig iron producers continue to shade prices, the Scotch interests leading. Inquiry from the Far East is quiet, especially for sheets and tin plate, and the mills are seeking business. The week's changes in quotations brings the following products to the prices noted: English and Scotch plates for home consumption and export £9 5s ($42.83); hoops, home £12 ($55.56), for export £11 15s ($54.40); Middlesbrough No. 3 foundry iron £6 2s ($28.24), No. 3 Scotch foundry iron £5 15s ($26.62).

Sterling Exchange is figured on a basis of $4.63.

Trends in British Markets Are Analyzed

European Staff Special

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

BIRMINGHAM, Eng., May 18.—The downward movement of prices has quickened a little during the past week. Pig iron is the only element which appears to possess staying power. Cleveland No. 3 iron which recently moved back to £6 5s ($28.84) is holding at this figure. Some weakness has developed in Scotland. The Scotch figure having been reduced to £5 17s 6d ($27.14), there is no opportunity for sales either from Cleveland or the Northampton district. With the single exception of North Staffordshire which recently made a cut of 7 shillings 6 pence per ton Midland irons are firm.

Furnace coke is a strong factor and is slightly higher. Scarcity of coke and the uncertainty of the market has suspended for the present any question of relighting furnaces in England. Consumers will have to count upon the present rate of output for some little time, possibly throughout the summer. Three furnaces have been started by William Baird & Co. Ltd., at Kilwinning in Scotland, after being idle for about two years.

There still is a fair demand for West Coast iron, absorbing the output of the 18 furnaces now at work, and business is fairly divided between the Midlands and Scotland with smaller quantities going to South Wales. There are moderate sales to France, Belgium and Germany, but American buying has been checked by high prices. Despite the rise in ferromanganese a good business still is being done with America on the

Sterling—$4.62

basis of the new price of £20 ($92.40) per ton.

The difference in the position between raw material and semifinished and finished steels is very marked. The Belgians have been seeking business at prices much lower than have been heard of for some time. Every user of semifinished steel at the Birmingham market brought with him one or more Belgian quotations representing large reductions. The lowest quotation for 2-inch billets appears to be £7 17s 6d ($36.38) delivered. This seems to have been an isolated case, but offers on the basis of £8 ($36.96) and £8 2s 6d ($37.53) are common. English prices have been reduced considerably. Tin bars and sheet bars have been cut 17s 6d ($4.04) to £9 2s 6d ($42.15) the customary rebate of 7 shillings 6 pence ($1.73) being retained. This brings the price down to £8 15s ($40.42).

For ordinary billets the price quoted in Birmingham is £8 15s ($40.42) but £8 10s ($39.27) would be accepted for a good tonnage.

The fall in semifinished steel has carried with it easier prices for rerolled material, small steel bars being obtainable as low as £11 ($50.82). Steel skelp for making tubes can be bought at £11 10s ($53.13) as against £12 15s ($58.90) to £13 ($60.06) for iron skelp.

So far the large steelworks have made no further alterations in their standard quotations. Most of them are well situated for orders. Managers still adhere to their theory that the present lull will not continue into the autumn. They derive encouragement from the enormous American demand announced in this country by a series of IRON TRADE REVIEW cablegrams. Some large undertakings are pending, and in the meantime many small contracts in constructional engineering are being given out. Some encouragement is derived from the maintenance of export totals during April. The fact that exports are about double those of a year ago, and for certain pig irons have been quadrupled, gives considerable hope that English makers will retain their hold on the foreign market which they have been able to recover during the past 12 months. A certain amount of public confidence is indicated by the recoveries in share values. Whereas, on Sept. 29, 1922 shares of the nominal value of 100 were reduced to 76.9 by April 13 they had advanced to 88.7. A rise in the values of leading firms has been a marked feature of the share market during the past week or two.

Tinplate prices have been reduced by 1 shilling ($0.23) per box, the latest quotation being £1 3s 1½d ($5.33). In addition to the reduction in semifinished steel the trade benefits to some extent by a decided slump in tin prices. A fair amount of business is being done with the Continent and South America, but home buying is on a small scale.

(*Concluded on Page* 1624)

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8-Hour Day Brought Nearer

TO THOSE familiar with present day business conditions and problems of management in the iron and steel industry, the report of the committee of manufacturers to the American Iron and Steel institute on the proposed elimination of the 12-hour day, occasions no surprise. The conclusions reached are those logically to be expected from large executives charged with pressing responsibilities of production and service. Consequently, they are essentially practical, business-like and free of the sophistries which such an occasion would be apt to inspire among those thinking more of effects than plain business economics.

To put the 8-hour day or a three-shift system into effect in the iron and steel industry would require 60,000 additional men and add 15 per cent to production costs, the report says. Where are these men to come from? Could present heavy necessities be met and would the public consent to pay the increased price for iron and steel, if such a change should be made? These are essentially practical questions which the business mind automatically stands up against academic or theoretic considerations. This is especially true since the humanitarian side of the matter, at least with respect to the physical hardship to the workman under the conditions of his employment, has not been established beyond reasonable doubt.

Various editorial comments and newspaper articles on the action taken represent the iron and steel industry as unalterably opposed to the abolishment of the 12-hour day. That, of course, would be the spectacular way in which to present the matter. The report commits the iron and steel industry to no such position. In fact, is does the very opposite. It favors the entire abolishment of the 12-hour day when the problems involved which it clearly catalogs, may be properly solved. The element of time is made fundamental. If the iron and steel manufacturers had been more concerned with public opinion than with the oconomics of the general question, they could have made their endorsement, even though qualified of the short work turn, the main rather than the related feature of their findings, and thereby have gained the plaudits. But they addressed the question from the plain and practical end as business men are accustomed to consider any major problem.

That the obstacles to the solution of the problem, are not insurmountable, needs no assurance. It may be said in all proper faith, that the universal 8-hour day in the iron and steel industry has been brought closer than ever before by the committee's report.

Credit Conditions Remain Sound

ONE OF the most striking and encouraging characteristics of the present economic situation is the ease of money rates and the superabundance of credit resources. The fact that the federal reserve board and its advisers, after a careful diagnosis of financial and business conditions, have decided against an advance in rediscount rates at this time is a tribute to the underlying soundness of basic factors. There has been no inflation of credit and the soaring of prices has been checked.

Some two months ago many commodity values were advancing rapidly and trade was showing indications of developing the same giddy excesses which brought disaster in 1920. Then it was believed that the federal reserve board would be compelled to advance rediscount rates as a precautionary measure. Warnings were sounded, however, and the lessons of three years ago were so fresh in mind that business men speedily began to apply the brakes of their own volition. As a result the evils which threatened in March have been corrected, and business continues to keep its feet on solid ground. Recognition of this fact and the fading of fears of a major trade reaction are reflected in the recent turn upward of the security markets and the stronger tone now appearing in numerous commodity markets, recently under pressure.

The lull in trade and the check in price advances has brought a lessened demand for commercial bank loans. Money rates have softened recently as a re-

sult. One outgrowth of easier money rates has been a stiffening tendency for bonds. The enormous volume of free investment capital was shown in the more than double over-subscriptions to the latest government treasury loan of $382,000,000. This issue bore 4¼ per cent. In 1920 the government with difficulty was able to obtain a loan of about $250,000,000 bearing 6 per cent.

One explanation for the current strength of bond prices goes back to a fundamental difference in business policy between now and three years ago. Large banking institutions report that big industries are keeping their surplus resources in liquid form. The money is being loaned by some companies on call on Wall street. Others are keeping it on deposit in banks and still others are investing in good bonds. This is in marked contrast with 1920 when the money market was being drained by the piling up of high priced inventories and by unwise plant expansions. Business policies such as this do not form the background for a severe business depression. Nothing could be more symptomatic of the healthier condition now obtaining in both finance and industry.

The free flow of investment funds is meeting a check in the construction industry. Bankers in various parts of the country are beginning to draw in the purse strings on building loans. They believe that costs have soared to a point where investment safety is being brought into jeopardy. An inevitable result of this policy will be curtailment of the building program.

Obtaining Results from Time Study

IN VIEW of the uncertain results attending many repeated efforts to establish principles of scientific management in the steel industry, the paper presented by Robert Gregg at the meeting of the American Iron and Steel institute is enlightening. The author explains how melting and rolling practice in a steel plant is being standardized by means of time study. This he does in an unpretentious way and with unusual freedom from the use of terms commonly associated with the work of "Efficiency experts."

In investigating the open-hearth department, explains Mr. Gregg, a minute log of the furnaces and all auxiliary equipment was kept. This method of attack uncovered many delays, mostly mechanical, which were analyzed and traced to their sources. It was found that the charging machine caused considerable delay, owing to breakdowns resulting from improper inspection. Hydraulic piping was found to be in bad shape and valves, ladle stands, motors, etc., were not sufficiently protected. A similar study was made of rolling practice, with the result that four men were eliminated by satisfactorily combining jobs.

Standardization work of this kind pays if properly administered. The management must enjoy the cooperation of employes and the application of principles of time study to specific problems must be dictated by common sense, tempered by tact and good judgment. In many cases the best results can be obtained by attacking the problem in an informal way, avoiding the use of "time study" and other terms usually misunderstood and discredited by employes. The main thing is to know that the factors affecting efficiency are periodically checked, and that improper conditions thereby revealed are corrected promptly.

Steel Needs of Oil Industry Expand

ONE of the important developments of late in the steel market has been the great curtailment in the purchases of the oil companies. This industry which consistently has been buying tremendous tonnages in the form of oil storage tanks, pipe lines and oil country goods, now is a market factor of comparatively small proportions.

The reasons for this falling off in demand are given by the oil companies themselves as twofold. They say that current steel prices are too high and the deliveries obtainable are too remote. Secondly, they point out that as a result of the huge tonnages that have been placed the industry is well supplied with storage tanks, pipe lines and other equipment. The oil companies point out that present stocks of oil are larger than ever before in history. Due to the size of present stocks all of the large oil companies have curtailed their production. As a result, they say, there is no present need for further large tonnages, at least in the way of oil storage tanks and oil country equipment. One large oil interest goes so far as to say that at least three or four years will elapse before any large buying movement in oil storage tanks will develop.

Despite these explanations by the oil companies as to the reasons for their dwindling purchases of steel, the fact remains that during the last two months inquiries from the oil companies aggregating at least several hundreds of thousands of tons have been put out for prices and since have been withdrawn. The original appearance of these inquiries must have been based to some extent upon real needs and their withdrawal means only that the material could not be purchased on a satisfactory basis. The tremendous growth of the oil industry, the great increase in the use of oil as a fuel, and the extent to which expansion in oil development has kept pace with general expansion, well may be taken to indicate that pessimistic views with respect to the growth of this industry are groundless. As a matter of fact, not only the steel involved in the inquiries which recently were withdrawn, but large additional tonnages, will be closed when the conditions for buying are more propitious.

Cannot Eliminate 12-Hour Day

Special Investigating Committee of Manufacturers Reports to Iron and Steel Institute Lack of Labor and Increased Costs Prevent Adoption of 8-Hour Day —Strong Optimisim Over Business Outlook Marks Meeting

ABOLISHMENT of the 12-hour day in the iron and steel industry is not possible or feasible at this time. This is the position definitely taken by the whole industry through the unanimous adoption by its representatives in attendance upon the twenty-third general meeting of the American Iron and Steel institute at New York May 25, of the report of the special committee following an investigation of this subject urged by President Harding several months ago. The committee expressed itself favorable to the abandonment of the long turn whenever labor supplies are adequate and the public is disposed to accept the higher prices resulting from this step which it is declared the advanced costs will compel.

The action taken on the 12-hour day was one of the two features of broad importance standing forth from the meeting which in several respects was one of the best and largest in the history of the institute.

The other outstanding contribution was the positive and vigorous optimism regarding the present business situation and future outlook in the iron and steel industry. Seldom has Judge Gary in his address as president of the institute given a more confident and convincing portrayal of the strength of fundamental conditions, at least for the next six months. His statements, it was apparent, produced a very wholesome effect and have gone far toward counteracting the recent spread of distrust and uncertainty in business which Judge Gary ascribed largely as originating in propaganda and deliberate effort on the part of a few.

Prosperity Is Predicted for Months To Come

UNANIMOUS adoption of the report of the committee to consider the abolition of the 12-hour day followed the reading by Judge Gary at the opening of the morning session. The motion to adopt was made by Willis McCook, president of the Pittsburgh Steel Co. and the seconding was done by Severn P. Ker, president of the Sharon Steel Hoop Co. and by Mr. Schwab.

Before presenting the report, Judge Gary made some remarks on the form and progress of the investigation. He said experts had been employed by the committee to make a thorough examination of local conditions with regard to all facts. The general committee had met at various times and had discussed the problem very thoroughly but it was not until a month ago that the committee or any member expressed an opinion as to what findings should be made and what report should be made to the membership. Only very recently was the report formulated and it was signed by all members of the committee.

Prince Is Banquet Guest

Attended by more than 1400 members, the second largest gathering in the history of the institute, the annual dinner was a brilliant affair, with Prince Gelascio Gaetani, the Italian ambassador, the principal speaker. Other speakers were William U. Follansbee and Charles M. Schwab, who predicted continued prosperity in the iron and steel industry for many months to come. Judge Gary, fully recovered from his slight indisposition of earlier in the day, presided.

Judge Gary at the banquet read a telegram which he said he had received from "our beloved Uncle Joe." This telegram was received with great applause. It read as follows:

"I send you and all the members present at the annual banquet as well as all members of the institute unable to be present, my affectionate regards and kind remembrances. My physical condition prevents traveling. I am assured by the doctors that my recovery is slow but sure and I will be with you later on. My heart goes out to you all in loving kindness and I subscribe myself the second oldest living member of the American Iron and Steel institute."

J. G. BUTLER JR.

In the course of the evening, Secretary Clarke announced the award of a special prize of $1000 by Sir Robert Hatfield of Hatfields Ltd., Sheffield, England, to C. L. Kinney, superintendent of the No. 1 open hearth and G. R. McDermott, assistant chief engineer of the South Chicago Works of the Illinois Steel Co. This award was offered by Sir Robert Hatfield for the best paper on a steel subject to be presented before the American Iron and Steel institute in a given time. The prize-winning paper was that entitled "The Thermal Efficiency and Heat Balance of an Open-Hearth Furnace," prepared jointly by Mr. McKinney and Mr. McDermott, and presented at the October, 1922 meeting of the institute. The award was recently made to the authors at a dinner in New York.

In introducing Prince Gaetani, Judge Gary spoke of the political and engineering achievements of the guest of honor and touched on his distinguished war record. It was Prince Gaetani, he said, who was in direct charge of the Italian division which turned back the Austrian forces at a time when they seriously threatened the national existance of Italy. Judge Gary told of years spent previously in this country by the ambassador during which the latter had obtained degrees at two American universities, a remark to which Prince Gaetani later referred when he said that he appeared before the institute not only as a representative of Italy, but as an American engineer. Judge Gary proposed a toast to the President of the United States and the King of Italy.

Will Meet Obligations

Asserting that Italy was on the road to rapid recovery, Prince Gaetani analyzed briefly the Fascisti movement in his country, and alluded to it as the antithesis of communism. It has provided, he said, a sound, healthy foundation for a new Italy, and recognizes both capital and labor as essential and inseparable. He spoke of the tremendous hydroelectric development now going forward in Italy. Of 4,000,000 kilowatts of power available, virtually 70 per cent will be operative upon completion of work now under way. He confirmed Italy's intention of meeting its financial obligations to the United States, adding that it only asks the facilities offered England, taking into consideration its economic position.

Although whimsically stating that "he was living in dreams of happy days gone by," Charles M. Schwab, not only delighted his audience with reminicences of his 42 years in the iron and steel industry, but indicated clearly his usual broad grasp of affairs. He spoke optimistically of the

future of the industry, and stressed his belief that the end of present prosperity is not in sight. William U. Folansbee pointed to the harmony existing in the steel industry between employers and employes. He believed the industry was to be congratulated, particularly in view of labor unrest in certain other branches, notably in the building trades. He referred to the considerate attitude and understanding manifested by the labor representatives at the recent meeting between sheet and tin plate producers and representatives of the Amalgamated Association of Iron and Steel and Tin Workers. After a careful and considerate weighing of the facts, the existing wage scale was extended for another year. He believed that steel workers, as well as all other interests in the industry, still have vivid recollections of the depression following 1920, and are doing all in their power to keep business on an even keel.

The institute has been invited by the Army Ordnance association to participate in a joint meeting at the Aberdeen proving Ground, Maryland next October, Secretary Clarke announced at the morning meeting. If the plan is carried out the regular fall meeting of the institute will be held in New York, Thursday, Oct. 25 and the membership in a body will travel to Aberdeen by special train that night and join in the meeting the next day. The program in view provides for maneuvers and demonstrations of various types of heavy and light artillery, small arms, tanks and tractors and other army equipment. Secretary Clarke explained the desire of the army authorities to establish closer working relations with such key industries as that of iron and steel. The members of the institute were asked to register their wishes whether or not the trip should be carried out.

Gary Is Overcome

NEAR the end of the reading of his long address Friday morning, Judge Gary faltered, turned white and finally called upon Mr. Schwab to complete the presentation. The heavy air of the crowded room together with the exertion of the reading appeared to have overtaxed Judge Gary's strength. "I can furnish the voice but not the brains" said Mr. Schwab in taking up the reading. Judge Gary rested a while and quickly recovered from the effects of his exhaustion. He was able to preside in his customary manner at the meeting of the institute directors at noon and at the banquet. Paying tribute at the banquet to Judge Gary's leadership of the steel industry, Mr. Schwab alluded to the morning incident saying how all the members had been struck with the fear that their president's health might be impaired. He expressed the hope that Judge Gary's wise direction and counsel would be spared to the institute for many years to come. Judge Gary celebrated his seventy-sixth birthday, Oct. 8.

The technical papers presented at the meeting included: "The Value of Chemistry in the Iron and Steel Industry" by W. A. Forbes, United States Steel Corp., New York, which was discussed by Bradley Dewey, president of the Dewey & Almy Chemical Co., Cambridge, Mass; "Motor Driven Rolling Mills" by H. E. Davis, electrical engineer, Interstate Iron & Steel Co., South Chicago, Ill., which was discussed by G. E. Stoltz, chief electrical engineer of the Westinghouse Electric & Mfg. Co.; "The Standardization of Steel Mill Practice by Time Studies" by Robert Gregg, president, Atlantic Steel Co., Atlanta, Ga.; which was discussed by A. L. Culbertson of the Chapman Engineering Co., New York and E. C. Siebert, fuel engineer of the Bethlehem Steel Corp., South Bethlehem, Pa.; "Gas Producer Practice in Steel Works," by Waldemar Dyrssen, United States Steel Corp., New York, which was discussed by E. A. W. Jefferies, sales manager of the Morgan Construction Co., Worcester, Mass.; "Methods in Waste Elimination" by H. T. Morris, metallurgical engineer, Bethlehem Steel Corp., Bethlehem, Pa. which was discussed by J. J. V. W. Reynders, consulting engineer, New York; "The Disintegration of Fire Brick in Blast Furnaces" by C. E. Nesbit, and M. C. Bell, research engineers, Edgar Thomson Works, Carnegie Steel Co., Bethlehem, Pa. which was discussed by James H. France, general manager, General Refractories Co.

At the directors' meeting at noon the present officers were re-elected for the ensuing year. These were President, E. H. Gary; vice presidents, Willis L. King, Jones & Laughlin Steel Corp.; Charles M. Schwab, Bethlehem Steel Corp., and John A. Topping, Republic Iron & Steel Co.; treasurer, W. J. Filbert, United States Steel Corp.

On exhibition at the meeting were a large numbers of pastels by R. D. Mackenzie of Birmingham, Ala., depicting with strong realism, various operations of iron and steel works. These studies were produced by the artist from actual working scenes in the plants of the Tennessee Coal Iron & Railroad Co.

Complete 12-Hour Day Report Adopted

ALTHOUGH the committee appointed by the president of the American Iron and Steel institute, to consider the 12-hour day work in the steel industry and report conclusions and recommendations, has made a very careful and painstaking study of the facts and figures developed, it is not yet ready to make what it would designate a final report.

Apparently the underlying reason for the agitation which resulted in the appointment of this committee was based on a sentiment (not created or endorsed by the workmen themselves) that the 12-hour day was an unreasonable hardship upon the employes who were connected with it; that it was physically injurious to a large percentage of the employes; and that it interfered with family associations essential to the welfare of the children; that for these reasons it was, in a sense, opposed to the public interest.

Whatever will be said against the 12-hour day in the steel industry, investigation has convinced this committee that the same has not of itself been an injury to the employes, physically, mentally or morally. Whether or not, in the large majority of cases, 12-hour men devote less time to their families than the employes working less hours is perhaps questionable.

A part of the manufacturing of iron and steel is necessarily continuous. Therefore, practically, there must be two shifts of 12 hours or three shifts of 8 hours. The workmen, as a rule, prefer the longer hours because it permits larger compensation per day.

It is asserted with confidence that there is less physical work, as a total per day, and less fatigue from the work of the 12-hour day in the steel industry, than pertains to the large majority of the 8-hour men. This is because in the former case there are more rest periods during the 12 hours on duty.

In the opinion of the members of the committee there is no concern of importance connected with the iron and steel industry in the United States that would urge or willingly permit employes to exert themselves to a point where they would be injured physically, mentally or morally. Desire and effort to improve the conditions and promote the welfare of employes in the iron and steel industry of this country has been a cardinal

(*Concluded on Page* 1620)

Prosperity Still on Sound Basis

Steel Industry Assured of Highly Satisfactory Conditions for at Least Six Months, Even if Building Construction Is Postponed—Present Prices Fair, Should Not Be Inflated—Arbitrate Ruhr Problem

BY E. H. GARY

AS SOME of you know, your president has recently made a Mediterranean trip. The voyage was made on the MAURETANIA.....

The ship left New York Feb. 7 and returned April 13. We went to the Madeira islands, to Cadiz, Spain, thence by automobile to Seville and to Gibraltar, where we joined the ship; then to Algiers, Nice Naples, Constantinople, Athens and Haifa, Palestine. From there we went by railroad to Jerusalem and then across the desert, but in sight of sea most of the time, to Cairo, crossing the Suez canal at El Kantara el Khazneh.

Later we traveled by railroad to Alexandria, where the ship had gone from Haifa and had been waiting for about 12 days. From there we sailed to Naples, went to and returned from Rome by railroad, then sailed to Ajaccio, Corsica; Lisbon, Portugal, and to Southampton for a visit of five days in London, and then home.

Just how much or how little to attempt to say on this occasion about the different countries visited and the trend of thought concerning current events is a problem.

Masses Tired of War

Every person of reasoning qualifications residing in the respective countries visited, from the highest to the lowest, is thoroughly tired of war. Its horrors, costs and destructive results have been so practically demonstrated during the last decade that the simplest mind abhors military conflict. The reasons, motives and emotions are not the same in all minds, but the conclusions are altogether or nearly unanimous. Every country would like to have peace, continuous and permanent.

The masses of the people believe that they have been exploited by a few in power, and that they and their helpless children unnecessarily have been made to hunger and starve and suffer and die. In private conversations this is said by modest and unaggressive persons in large numbers. They hope for relief. The Christian, the Mohammedan, the Jew, the Bedouin, publicly or privately, is praying for relief. They believe as never before that the time is coming when "wars and rumors of wars" shall cease. Whenever, if at all, this will be universal we, with our limit of understanding, cannot vision.

There is only one way of fairly and finally settling any controversy or question, and that is in consonance with the principles of the Christian religion. Whenever a nation or an individual reaches the point where, as the result of war or of shipwreck, or otherwise, immediate destruction is inevitable, assent to the idea expressed is natural and well-nigh universal. There are multitudes of people who believe that the fundamental and controlling doctrine of the nation's laws should be in accordance with the principles of the Holy Bible and that every lawmaker and administrator should be compelled to endorse and practice its undeniable precepts.

Another thing particularly noticeable at present in all southern countries is the disposition of the working classes concerning industry, frugality, economy and saving. The people there are all at work, and in many countries their food consists of bread, or its equivalent, and vegetables. They cannot afford more. They seem to be in good spirits and good health.

Certain it is that the great majority of the people in Italy, Turkey, Greece, Palestine and Egypt are acting as though they intend to do everything practicable to bring about a return to reasonable prosperity and comfort.

Christianity Spreading

The late wars seem to have influenced the rank and file of the men of the Near East to pay more attention to the long future. This appears from conversations with the dragomen or the merchants, the financiers or the working people of Egypt and other countries. It may be true that some, perhaps many, of the clergy or priests or teachers have taught or are teaching doctrines at variance with some parts of the Bible, particularly the New Testament. Others, of course, are better qualified to speak on this question; but that the influence of the principles of the Bible is now particularly extending all over the world and that it is essential to firmly re-establish peace, prosperity and happiness, cannot be reasonably denied.

The religious sentiment of the Near East, which seems apparent to a casual visitor, is striking and a hopeful sign for posterity. Indeed, this is in evidence throughout all continents. A token is found in the recent manly statements of President Harding concerning the Holy Bible. His utterances should furnish a theme for many sermons.

The American traveler, who visits foreign countries, is impressed with the striking changes that have occurred concerning the rule of monarchs. Some of these were predicted at or before the commencement of the late world war. Formerly kings were all independently potential. Now they have little to say when disagreements appear, however much beloved the monarch may be. Perhaps this is best, though there is always danger of carrying the distribution of governmental or state control too far for the welfare of the entire populations. If every one was a true patriot of highest moral principles, there would be no danger in the political horizon.

It may not be out of place to refer to the present situation in the Ruhr val-

Confidence, Keynote of Address

THERE is nothing in sight to indicate that there will be a substantial diminution of the demand for finished steel in this country during the next six months, to say the least.

"We were for months selling our products at prices that were too low for a fair return on our investments; but at present it would seem that selling prices are about right.

"To the extent we believe this statement is justified we should, if possible, prevent prices from going higher, notwithstanding the demand is large and urgent.

"When one considers the wealth, resources, increasing production and purchasing necessities of this country, the present business outlook is good.

"If each of the nations (involved in the Ruhr) should submit every question to a disinterested and impartial foreign nation to be mutually selected, agreeing to abide by the decision, the whole matter could be disposed of with justice to all and injustice to none."—E. H. Gary in address to American Iron and Steel institute.

Abstract of address by the chairman of the United States Steel Corp., at the twenty-third general meeting, New York, May 25, of the American Iron and Steel institute, of which he is president.

ley, although obviously it would be inexcusable for a private citizen of the United States to publicly express an opinion concerning the merits of the existing controversy.

That it is unfortunate, deplorable, and creates a bad influence extending far beyond the three nations particularly involved, will be generally conceded. The daily cost to the French and Belgians must be enormous; that there is considerable suffering and some deaths in their ranks is probable. On the other side there are many deaths and the daily cost and the personal suffering are very great; and in addition their damage to property and business is appalling. Neither side can afford the losses which will result from the continuance of the conflict, and the adverse effect upon the whole world, as a final result, will be greater than in advance can be appraised.

Recent statements made by important citizens of Germany, Belgium and France, respectively, indicate that the peoples of all these countries generally would like to see an early and satisfactory disposition of all their international differences. What action could be taken, or when, or in what manner, or by whom, is a problem not easy of solution. However, if each of the nations should in due form submit every question involved to a disinterested and impartial foreign nation to be mutually selected, agreeing to abide by the decision, the whole matter could be disposed of with justice to all and injustice to none; or if, for instance, the submission should be made to such a man as Secretary of State, ex-Justice Hughes, and all the pertinent facts furnished, there would be a prompt and early decision, fair, intelligent and just; and it would surely command the respect of all nations, including France, Germany and Belgium. If urged he ought to be willing to serve, notwithstanding the heavy burdens he is carrying.

Business Outlook Good

It is not difficult to ascertain and accurately state what has happened or is occurring in the iron and steel business of this country, or to guess what may hereafter occur; but to state with certainty what will happen in the future, even for a period of six months, is impossible, though many of us in practice, from conditions as they exist, reason to a conclusion as to what is likely to happen in the near future and act accordingly.

At present the furnaces and mills of iron and steel manufacturers are operating nearly to full capacity, limited and modified only by a lack of sufficient working forces. The producers find it difficult to satisfy the peremptory demands of consumers; this has been the situation for some months past. Stocks of finished materials in our warehouses and at the mills are very low. The unfilled orders on the books of steel manufacturers are now less than fifteen or sixteen million tons and the new bookings and shipments of finished materials per day for the whole industry are eighty or ninety thousand tons. In short, there is nothing in sight to indicate that there will be a substantial diminution of the demand for finished steel in this country during the next six months, to say the least.

Of course, as always, conditions may change materially and suddenly, depending upon circumstances, but the necessities of consumers in the United States and of those in foreign countries who are our customers are so great, the population is increasing so rapidly, and the ability to buy and pay for steel, as shown by financial statements, so large, there is within view no reason to suppose there will be, certainly not in the future, a material slackening in demand and use. The bank deposits in twenty-five banks only are said to be about eight billion dollars. Much depends upon the attitude of the business men. This includes both sellers and buyers; and it is to be remembered most of the buyers of our products are also sellers, in some form or another, of the materials which they buy.

Cause for Building Letdown

There has of late apparently been a deliberate and persistent attempt to create an impression that there will be in the near future, a substantial recession in business activities. Business men generally understand this. The propaganda is inspired by a few shortsighted persons who do not seem to understand that if they could succeed in wrecking the business structure they would themselves be buried in the ruins.

However, the postponements in some lines of business operations have not wholly resulted from deliberate and unworthy propaganda. In the building lines particularly, where work has not already been commenced, projected operations more or less have been postponed by reason of the extraordinary and inordinate prices charged by certain trades for wage rates, and also by the numerous strikes or threatened strikes for still higher wage rates. One need only read the reports published in the press to be convinced of these facts.

As often stated publicly, 85 per cent or more of the cost of producing steel, from the raw products to the finished material, is paid to the workmen. When, in order to secure sufficient workmen on buildings, contractors are compelled to pay the carpenters, painters, bricklayers, plasterers, plumbers and others in kindred lines, $10 and upward per day of eight hours, and this to workmen who are demanding a 5-day week, with arbitrary limits of the work done, it is not surprising if the building of costly structures is being postponed until more favorable conditions shall obtain. The wonder is that there has been so much building during the last 18 months.

Consumer Must Pay

As a matter, of course, the public will soon discover, if it is not already generally understood, that extortionate prices for materials or labor must eventually be paid by the consumer. Every unreasonable or unfair burden in business operations must eventually fall upon the user; and the law of supply and demand will sooner or later bring about exposure and remedial action which will secure fair and proper adjustments. In this connection, it is proper, though not necessary, to suggest that the steel manufacturers, in their own interest, must not permit prices for their commodities to go above a point which is fair and unreasonable. We were for months selling our products at prices that were too low for a fair return on our investments; but at present it would seem that selling prices are about right. To the extent we believe this statement is justified we should, if possible, prevent them from going higher, notwithstanding the demand is large and urgent.

Building operations, though important, are a small percentage of our business. Even though there should be no more new contracts for structural steel during the next six months, apparently the steel business taken as a whole would be satisfactory.

When one considers the wealth, resources, increasing production and purchasing necessities of this country, the present business outlook is good. And this is said in the face of very heavy burdens of taxation, unnecessary and unreasonable political and social agitations precipitated by those who have nothing financial at stake, the unfortunate troubles pending in foreign countries, and the bugbear of politics.

It must be admitted that if one reads the *Congressional Record* when congress is in session and visits the rooms of the congressional committees, where may be found organized minority groups urging propositions that have no merit, many of them with destructive tendencies, there is some ground for discouragement; but if one will turn about face and leave these circles of despondency and go out upon the farms, and in the manufactories, and along the transportation arteries, and into the active mines, one is compelled to conclude that the constructive forces of the United States are so great by comparison that the small standing army of pessimists cannot for long or to any great extent interrupt the onward march of business activity.

Review Technical Progress in Iron and Steel

ROBERT GREGG

ROBERT GREGG is one of the country's youngest steel company presidents, having been elected to that office in the Atlantic Steel Co., Atlanta, Ga., in April, 1922, at the age of 37. He was born in Atlanta, April 14, 1885, and received his preliminary education in the public schools of Atlanta and in a preparatory school. He was graduated from the Georgia School of Technology in 1905 with the degree of bachelor of science, and in 1906 completed a post graduate course at Cornell university with the degree of mechanical engineer. He entered the employ of the Atlantic Steel Co. in August, 1906, as a clerk in the general superintendent's office; in 1907 was transferred to the open-hearth department, working as a helper on furnaces, and later in the same year was made cost accountant. In 1909 he was given charge of the accounting department, and in 1912 was made secretary of the company. He also was treasurer before his election as president.

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H. E. DAVIS

H. E. DAVIS, chief electrician, Interstate Iron & Steel Co., Chicago, was born in Osage, Kan., in 1885. He was graduated from high school in Chicago and then took an apprentice course in the electrical department, South Works, Illinois Steel Co., Chicago. Subsequently he was associated with the Universal Portland Cement Co., Colorado Fuel & Iron Co., and Wisconsin Steel division of the International Harvester Co. During this period he took a university extension course in electrical engineering. In 1912 he was appointed chief electrician of the Interstate company at its East Chicago mills. When the company acquired the South Chicago plant of the Grand Crossing Tack Co., he was placed in charge at South Chicago. This plant's capacity has been more than trebled since its acquisition by the Interstate company. Mr. Davis is a member of the Association of Iron and Steel Electrical Engineers, and vice chairman of the Chicago section of the association.

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M. L. BELL, research engineer, Carnegie Steel Co., Pittsburgh, who collaborated with C. E. Nesbitt in the preparation of the paper entitled "The Disintegration of Fire Brick Linings in Blast Furnaces," is a graduate of the New York State School of Ceramics, and is a well-known specialist in this branch of the iron and steel industry. Mr. Bell is ceramist at the Edgar Thompson works of the Carnegie company.

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M. L. BELL

C. E. NESBITT, research engineer, Carnegie Steel Co., Pittsburgh, has made a number of important contributions to the literature of refractories as to their application in the iron and steel industry. He was born in Columbus, O., and was graduated from the Ohio State university with the degree of chemical engineer. For the past 10 years he has done considerable research work in refractories, and has made extensive studies and tests. He is chief chemist at the Edgar Thompson works of the Carnegie Co. Mr. Nesbitt's paper, prepared jointly with M. L. Bell, "The Disintegration of Fire Brick Linings in Blast Furnaces," was one of the outstanding features of the institute's program.

C. E. NESBITT

Contribute to Success of Institute's Meeting

HARRY TIMOTHY MORRIS, metallurgical engineer, Bethlehem Steel Co., Bethlehem, Pa., was born in Pottsville, Pa., Jan. 30, 1870. He was graduated from Pottsville high school in 1885, and then served nearly two years on the mining engineer corps of the Girard Estate in Schuylkill and Columbia counties, Pennsylvania. He was graduated from Lehigh university in 1891 with the degree of mechanical engineer. He then entered the employ of the Maryland Steel Co., Sparrow's Point, Md., and as a laborer worked upon the erection of buildings for the bessemer and rail mills then under construction. When circumstances compelled this plant to cease operations temporarily in the fall of 1893, Mr. Morris was superintendent of the bessemer converting department. With the resumption of enlarged operations in the steel industry in 1895 he entered the works of the Bethlehem Iron Co. in South Bethlehem, Pa. Since then he has been continuously with the Bethlehem Iron Co. and its successor, the Bethlehem Steel Co. in various capacities, including superintendent of bessemer and rail mills; assistant superintendent of slabbing and rolled plate mills; superintendent of armor plate department; superintendent of Saucon plant; superintendent of projectile departments, and special engineer representative of the ordnance department in France, Germany, Great Britain and Ireland. During the world war he was at the head of a staff of Bethlehem Steel Co. engineers which supervised the installation in three British shipyards of Bethlehem turrets, guns and mountings upon a number of British warships.

H. T. MORRIS

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WILLIAM ALEXANDER FORBES, metallurgist, United States Steel Corp., New York, was born at Stockton-on-Tees, England, Oct. 26, 1876, and was educated in the public schools of Stockton and in the high school at Middlesbrough, England. He began work in the United States May 1, 1900 in the laboratory of Park Bros., Pittsburgh, and was engaged in laboratory work for the Carnegie Steel Co., Homestead, Pa., from October, 1895 to May, 1900. He was then with the National Tube Co., McKeesport, Pa., as assistant chemist, chief chemist and assistant superintendent of blast furnaces until October, 1904, resigning to give his whole attention to the steel corporation's coke committee work. He was transferred to the New York office of the corporation July, 1908, in connection with the same line of work, and now acts as secretary of coke and blast furnace committees.

W. A. FORBES

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Authors' Papers

Papers presented for discussion at the twenty-third general meeting of the American Iron and Steel institute, New York, May 25, and their authors were as follows:

"The Value of Chemistry in the Iron and Steel Industry," W. A. Forbes.

"Motor Driven Rolling Mills," H. E. Davis.

"The Standardization of Steel Mill Practice by Time Studies," Robert Gregg.

"Gas Producer Practice in Steelworks," Waldemar P. G. Dyrssen.

"Methods in Waste Elimination," H. T. Morris.

"The Disintegration of Fire Brick Linings in Blast Furnaces," C. E. Nesbitt and M. L. Bell.

WALDEMAR P. G. DYRSSEN, metallurgist, United States Steel Corp., was graduated from the Royal Technical university, Stockholm in 1908 with the degree of mining and metallurgical engineer. In 1909 he was associated with the construction department of the well known French establishment, Les Petits Fils de Francois de Wendel et Cie, Hayange, Lorraine. He was superintendent of blast furnace and open-hearth departments of the Uddeholm Co., Hagfors, Sweden, 1910 to 1912. In 1913 and 1914 he was with the construction department of the Bethlehem Steel Co., and has been associated with the Steel corporation since 1915.

WALDEMAR P. G. DYRSSEN

Reducing Waste in Steelmaking

Utilizing Heat Waste in Steelworks Offers Possibilities for Improved Efficiency—Electrification an Important Factor in Eliminating Driving Energy Losses—Standardization a Valuable Method of Fighting Waste

BY H. T. MORRIS

IN THE report on waste in industry and the recommendations for waste elimination made by the committee of the Federated American Engineering societies, the committee has conceived that a given practice is not wasteful until a better practice has been revealed, and doubtless this conception is allowable in developing formulas for application to the immediate diminution of waste in directions now quite obvious.

Scientists declare that by using the X-rays on the same metallic specimen at different angles, they have obtained spectrographs of the interference lines which enable them to compute the dimensions and spacing of atoms in the crytsal unit. They explain that this crystal unit of matter which we call solid is a collection of "atoms" separated by such great distances as to give the impression of points on a wide spaced lattice; and, therefore, they call this crystal unit a "crystal lattice."

They tell us further that we can no longer consider each of these atoms as a solid and indivisible sphere, but rather as a sort of solar system within which is an intensely active group of electrons revolving with great velocities about a nucleus, from which the electrons are removed at distances as great, relative to their diameters, as the distances which separate members of our solar system. These electrons are the basic units of all solids, liquids, gases, light, electricity and radio emanations; each electron being of the same substance as every other electron, differing in one form of matter from another only by the group arrangement in the various "atoms." Moreover, they tell us that the energy used to hold in equilibrium these myriads of revolving systems, if it could be released, would be a quantity heretofore unimagined.

Waste Conception Narrow

Thus it is no longer within the province of thinking men to scout the ultimate practicability of things heretofore deemed fantastic, and if there be enough energy in, say, a wheelbarrow load of boiler ashes to produce a steel ingot, then in the last analysis we are guilty of waste so long as this barrow load of ashes goes to the dump. From this viewpoint, the conception of the engineers' committee, regarding waste, is narrower than we can permanently allow.

While we must always bear in mind the value of contributions which come from the scientists' consideration, the problem that confronts the operating man is knowing what to do next, so let us today consider waste more particularly from the viewpoint which considers immediate solutions. The wastes I have in mind might be generalized into, waste of energy; waste of material, and waste of men.

These wastes may be due to faulty organization, which involves faulty planning as well as faulty execution. We will call anything waste that adversely affects the cost sheet, and we will remember the consumer's cost sheet as well as the producer's.

Taking first the more obvious wastes, we find that they are being attacked by investigators and experimenters whose work can usually be assigned to one of two categories, either the substitution of some radically different method or process (we will call workers along these lines "the far lookers"; or the betterment of existing methods or processes, we will call these "the near lookers"). Often the radical change of today becomes the practical method of tomorrow and universally "the near lookers" are daily achieving waste eliminations by improving existing methods and apparatus.

Among the more obvious wastes in our industry, waste of heat generally makes the most startling impression on the engineer who is beginning to study the steel works problem. Such heat wastes would include the sensible heat of pig iron and cinder just tapped from the blast furnaces; the sensible heat in steel just tapped from the refining furnace; the sensible heat in coke just pushed from a by-product oven; the latent heat of steam, however, economically the steam be used; the sensible heat of steam exhausted into the atmosphere; the waste whenever fuel is burned in air, due to bringing in, heating and exhausting four volumes of nitrogen in order ot utilize in combustion one volume of oxygen; and many other less apparent heat losses.

A radical change in blast furnace practice proposes reduction methods at temperatures far below those necessary to melt the iron ores. These methods if commercially successful would dispense with large quantities of fuel, limestone and air, and would produce iron at a temperature hundreds of degrees below the melting point with no cinder at all. Were such a process reduced to practice it would eliminate a large part of the blowing and heat recovering apparatus. However, such methods would demand fine grinding of the ores, separation of the ground iron oxides from the nonferrous materials, and their reduction by gas-borne carbon. The resultant product would have to be put in shape for melting and conversion into steel ready to cast into ingots.

Another radical change involves the electric deposition of metallic iron. Electric deposition is commercially practiced in the manufacture of certain nonferrous metals; and there seems to be no reason to believe that it may not some day be applied to the economical separation of iron from its ores.

Experiments in concentrating atmospheric oxygen foreshadow the possibility that the "wind" blown into blast furnaces may some day be largely freed of nitrogen. This would greatly diminish the cost and size of blast furnace installations, but it would demand better refractories than are now obtainable.

Furnace Practice Improves

Even if these plans become the practice of the future, immediate problems must be solved by "the near lookers". They have taken the little cold-blast furnaces of our grandfathers and in many ways have improved on them by recovering in hot blast stoves for the ingoing blast large amounts of the sensible heat of outgoing gases, by utilizing large portions of the calorific content of these once waste gases to furnish power for pumping the blast, for handling the charges, for lighting the plant and for delivering useful energy to consumers outside the plant. Further betterments have increased the cubic capacity of the furnace stacks, modified their shape, dimensions, methods of charging and systems of operation, so as to enormously increase the speed of melting and reduction, with consequent greatly increased fuel efficiency.

The establishment of direct metal handling to the steel plant and the development of the storage "mixer" were, important steps toward transforming sensi-

From a paper presented at the spring meeting of the American Iron and Steel institute, New York, May 25, 1923. The author is metallurgical engineer, Bethlehem Steel Corp., Bethlehem, Pa.

ble heat, once wasted, into an asset of initial heat for the steel refining furnace. Other attacks on blast furnace wastes, which promise imminent, good results, are being directed along such lines as further conservation of the sensible heat in blast furnace products; more complete and more efficient regulation of gas-combustion; faster driving through improved interior stacklines, and through improved means of retaining these lines; better preparation, sizing and assorting of raw materials; improved material handling and transportation, and better refractories.

Gas Savings Large

Substantial savings have been effected in the current century through recovery of gas and valuable by-products in by-product coking ovens. A field for waste elimination exists wherever soft coal is burned before coking or is coked without by-product recovery. The abandonment of coke quenching should be an aim, to obtain benefits in heat saving, in reduced breakage in transit, diminished fragmentation in the furnace and in increased combustibility. Increased coal storage facilities with resultant constancy of mixtures should improve coke quality and uniformity. Gas that is bled away on week days and gas made on Sundays constitute instances of waste to be overcome. There is waste in producer gas, unless provisions are made for maintaining constant calorific value, and constant rate of delivery to consuming furnaces. Mechanical producers have been designed to accomplish these objects.

The modern regenerative furnace and the continuous heating furnace, using through efficient burners gas, oil or tar, embody methods of combustion and of heat utilization far in advance of the old direct fired, low roof furnace of little more than a generation ago. The movable car bottom and the electric charging and drawing machine have minimized time, labor and heat losses. There still seems to be opportunity for improvement in heating furnaces, soaking pits, and the like; both in fuel economy and in uniformity of heating.

Waste heat boilers now convert into steam much of the heat formerly carried into the stacks of melting and heating furnaces. This would seem to indicate that regenerative chambers have not yet been developed to the ultimate of their heat recovering possibilities. Steam turbines using highly superheated steam are indicated as heat waste eliminators. Their development is attended by high temperatures and on that account brings problems in strength of materials, lubrication and other conditions.

Internal combustion engines, already developed into great fuel savers, have still greater possibilities, whether using gas, petroleum or other liquid fuels.

Next to fuel and labor costs stands refractories cost, the third greatest expense in steel plant operation. Waste avoidance demands that refractories betterments keep pace with other betterments in the steel industry. Progress in some metallurgical directions has already been halted by the limitations of the refractories, so that, to resist the higher temperatures, the greater loads and the more severe abrasion of the near future, much better refractories are needed.

Refractory bricks have been improved by more discriminating selection of raw materials, better control of kiln-temperatures and heat-distribution, and careful assignment of varying grades of finished product to various service.

Notwithstanding that much progress toward eliminating waste in open-hearth melting was made around the beginning of the present century, the past few years have seen remarkable efforts toward increased fuel economy, through better and quicker combustion more directly concentrated on the charge. American electric furnace developments commenced in the current century have, in the past few years, rapidly expanded. This has meant economies in high grade steel manufacture, and he would be rather rash who ventured to deny the possibility of economies in commercial steels through further developments not yet visualized in this direction. Again it should be mentioned that refractories have much to do with the possibilities of progress along these lines.

Investigations into the sequence of the reactions in the bath, and of temperature relations to them, have been made and published. Progress through time and temperature control is indicated as possible not only toward larger production, but toward accurate achievement of desired composition and quality, tap after tap. It would aid materially in waste elimination, if every heat of metal should be exactly suited for the purpose intended.

Mills Effect Economies

In the rolling mill field, continuous mills of various kinds have worked great economies, and great savings may still be expected, both through wider adoption of these devices and through improvement in devices already adopted.

Designs, materials and manufacturing methods, which have in the past generation been greatly improved in rolls, housings, rollers and roller tables, manipulators, guides, drawing mechanism, shafting, gears, and other mill accessories, have not yet reached the limit of possibility. The elimination of breakdown delays, far progressed in the 30 years just passed, is still a field for further effort

The way has been blazed for a general saving in driving energy, through electrification of the main, as well as of the auxiliary, rolling mill drives. This makes possible important eliminations of waste. It enables more rapid rolling speeds, better control, and saving of human energy though smaller crews.

The ready means of distribution from generator to consuming unit suggests examination of the possibilities in the electric operation of switching locomotives. The centrally located steam driven generating plant would appear to be of advantageous for yard work as for long distance transportation.

Electric Heating Satisfactory

In those heating furnaces which require precise control of time and temperature, as in heat treating furnaces, the use of electricity insures the desired uniformity and temperature range to the treated objects. Waste is eliminated whenever the necessity of retreatment to obtain desired qualities has been avoided.

Let us now turn from heat and power to some of the many wastes of solid and liquid materials.

Fines of coke, ores, limestone, fluedust, and the like, which are produced in the operation of every steel plant, constitute waste unless efficiently utilized. The disposal of waste material is an added wasteful cost. Experimenters and investigators are at work on these problems and you know of sintering methods, of briquetting methods, and of other schemes to reclaim materials like these.

Methods of utilizing blast furnace slag have claimed attention. The most general use is as road making material, ballast, concrete constituent and the like. Certain slags have properties valuable in cement manufacture, and others have fertilizing properties. Much blast furnace slag, and still more melting furnace slag, is entirely waste under our present methods. Heating furnace cinders have a high iron content the value of which is diminished by their refractoriness and high silica content. Fields are open here for the development of better uses.

Metallic scrap goes out with slags from melting furnaces and blast furnaces. Unless recovery of this metal is attempted an avoidable waste occurs in each ladle sent to the dump.

Turnings, chips, thin shearings, punchings and trimmings, constitute a waste problem upon which various solutions are being tried They are the bane of the open-hearth man. More recently the tendency has been toward utilization of this material in blast furnaces. Scrap heaps of iron or steel objects, whose future utility is doubtful, constitute a source of

waste, unless frequently cleaned up and charged for melting and conversion into good ingots. Lubricants are often wastefully used, because methods for recovery and filtering are neglected. Water must be freely used for cooling purposes. The expense of pumping and the heat carried away by cooling water constitute wastes.

In ingots, as prevalently designed and cast, losses occur wherever requirements exist for a substantially sound and homogeneous finished product. This waste often can be largely reduced by classification of products so that parts of these top discards can be finished into products with less exacting requirements. Centrifugal casting is being adopted where shape conditions allow. Retardation of top cooling is a favorite plan, but the entirely satisfactory device seems to be still a matter of the future. Lower costs, body weight adjustment, minimized inconvenience and eliminated delays are still to be sought for in connection with this problem.

Use Single Purpose Machines

Where large numbers of the same article or parts are to be made day after day, "single-purpose" machines have been developed with remarkable resultant economies. The "single-purpose" idea has been expanded to entire plants, as seen in automobile manufacture and in some lines of the steel business. The wider adoption of this idea in the steel business is indicated as a trend in the future antiwaste campaign.

Rust has been a universal waster wherever iron or steel is found. The problem has been attacked in various directions; and almost carbonless irons, copper alloys, nickel alloys, chromium alloys, etc., have been developed. Doubtless, this source of waste will some day be largely eliminated in many different applications of iron and steel. Remarkable progress has been made in the broadcasting of heat treating knowledge and in its application to a growing range of alloyed steels, so that the secret methods and compositions known before 1900 only to armor plate makers and a few others, are now widely employed in many commercial steels.

Standardization is a valuable method of fighting waste If a number of electric motors be of the same size and make, one or two spare armatures will suffice for the lot. In similar manner, spare parts of all kinds can be materially reduced by extensive standardization. In the case of tool equipment, standardization reduces the required number of patterns, dies, rolls, or apparatus. Standardization of methods of sampling, testing, etc., enable just and intelligent comparisons of operation, and the consequent betterment of poor practices. Standardization of finished material specifications enables the producer, and the consumer, to talk the same language.

Inasmuch as the organization is largely responsible for many of the wastes that occur, and as personnel is the important factor of organization, often more important than the equipment, it seems clear that the personnel of the steel plant is one of the largest factors to be considered.

It is a wise organization which realizes in the selection of its gang-foremen that they should be men, not only technically schooled, but trained to carry on with the described standards of action. Such an organiation chooses its superintendents, advisors and executives from those trained gang foremen who have shown their ability to get along with men, as well as to produce goods.

Co-ordination of effort is an organization problem. If the materials are highly heated, like molten pig iron, such coordination is of great importance. When quantities are regularly handled, definite schedules should be applied where practicable.

Selection and consistent use of proper materials; discipline to the end that each and every time each detail of operation be certainly and properly performed; careful inspection of finished material, and rejection of that which is wrong in quantity, size, shape or condition.

Pieces called scrap, when designated for one purpose, may be useful if applied to another purpose. The organization which develops new uses for "scrap" and "refuse" material makes great headway in waste avoidance. Often processes must be modified and equipment scrapped and replaced to avoid waste.

Home Life Influences Efficiency

Any consideration of industrial waste is incomplete that stops with the engineering problems encountered inside the plant. A large part of the life of the employe is lived outside of this jurisdiction, and his major interests also lie outside. His family and his friends share in his recreations and in his spiritual life, as they do not share in his working life. It is in these fields that the groundwork is laid for his contentment or his discontent. If he can feel assured of his ability to feed, clothe, house, educate and maintain respect there will be the forces producing honest work and loyal service in his industrial relations. If he can be assured that honest work and loyal service will result in old age security for himself and his dependents, worriment will fail to diminish his health and his usefulness.

With these thoughts in mind it becomes clear that a complete antiwaste program should include consideration of matters that affect the worker in his home life and in his community life.

The battle against waste will have progressed far forward when all industry shall follow the lead of a large part of the steel industry in welfare work, "safety first" provisions, workmen's participation in management, service-retirement pensions, establishment of attractive homes and villages and other attacks on the waste of men.

There is one large subject of first importance to the waste problem, to be touched upon but briefly here because it has also a large sociological bearing. I refer to unemployment. The engineers' committee discusses unemployment due to strikes, lockouts and business depressions. The problem deserves our continuous and most serious thought. It seems that it can be solved only after the stabilization of costs and prices.

If this enumeration of the various phases of waste in industry shall, by suggesting new points of view, direct fruitful thought to the problems involved, the purpose of the paper will have been accomplished.

Instrument Plots Cooling Curves of Metal

Points at which critical transformations occur in cooling metals can be found by plotting cooling curves of the metals, the co-ordinates being temperature and time. This method is a valuable one in thermal analysis, and is known as the inverse rate method. This method generally has involved the plotting of cooling curves by hand, a laborious and time consuming process, except in one case in England where a recording chronograph was used. This instrument, however, is expensive, and the use of a single pen for recording time intervals continuously makes it necessary to employ a compensating device to take account of the time required for the pen to return to its base position.

In the plotting chronograph used at the bureau of standards, Washington, two pens are used, thereby obviating the necessity for providing such compensation. The apparatus was designed primarily for investigative work and has resulted in a saving in time in bureau tests of from 30 to 60 per cent over that formerly required, depending upon the temperature range over which determinations are desired. With slight modifications, however, it is well adapted for use in cases where extremely accurate and speedy determination of transformations in metals is desired. This instrument is described in Technological Paper No. 230 of the bureau of standards.

Solving Furnace Lining Problems

Laboratory Tests Are Conducted on Fire Brick for Blast Furnaces To Determine Cause of Disintegration and Its Prevention—Hard Burning Is Helpful but Not Desirable—Iron-Free Clay Must Be Used

BY C. E. NESBITT AND M. L. BELL

DISINTEGRATION as applied to linings of blast furnaces making iron, is a term used to describe a cracked, shattered or crumbled condition of some of the bricks found in a used lining. The degree of disintegration may vary in different linings from a few cracked bricks to those in which all resemblance to a brick has been lost and only a coarse, sandlike material remains. Such material is gray or almost black, as shown in Fig. 2, contains black spots of soft carbon and crumbles easily in the fingers.

While varying in type and character, disintegration generally will occur as a vertical band or zone of broken, crumbled bricks not quite parallel with the inner face of the lining, but gradually approaching the steel shell as it extends down the furnace, reaching at times from the top of furnace to below the mantel. In different linings, or even in the same lining, the zone may vary from a few inches to more than a foot in thickness as shown in Fig. 1.

In a single furnace, disintegration may be found at a certain level only to disappear at a lower level, possibly to reappear on the opposite side of the furnace. Besides occurring more or less locally, the occurrence is further complicated by the fact that a good or perfectly sound brick often is found among bricks completely disintegrated or the opposite happens and a broken, shattered brick is found among good bricks.

The carbon found in disintegrated linings is usually of a soot-like nature distributed throughout the brick in spots varying in size from those hardly visible to others of 1½ inch or more in diameter. At times the carbon is hard, partly graphitic in character, radiating from a small dark spot at the center. If these carbon spots are picked out and tested with a magnet they will be found weakly magnetic, indicating the presence of iron.

As no two furnaces are operated exactly alike, nor are the burden and quality of bricks exactly the same, it follows that disintegration differs in different linings. Linings in ferroalloy furnaces have a shorter life and show greater disintegration than those making iron. The greater coke consumption gives a higher temperature and a greater volume of gases. The gases themselves differ. The gas from the top of a furnace making ferromanganese is 50 per cent higher in carbon monoxide than that from an iron furnace. Disintegration seems to be greatest from 40 to 50 feet from the top of furnace, and appears to be more prevalent today than it was 15 to 20 years ago.

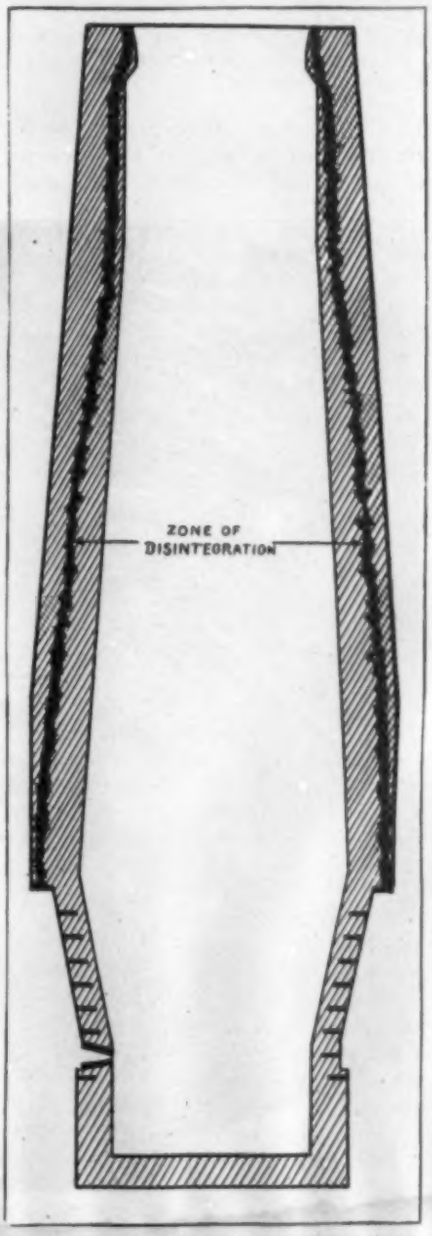


FIG. 1—CROSS SECTIONAL VIEW SHOWING THE DISINTEGRATED ZONE IN THE BLAST FURNACE LINING

A furnace not often is blown out solely because of disintegration, but disintegration may easily be a contributing cause. When a furnace develops a hot spot or, in other words, when the lining at some point has become so thin that the steel shell is no longer sufficiently protected, the furnace is blown out. Examination may reveal the lining to be sharply eroded at a point where the hot spot developed. If the cut is abrupt and sharp, disintegration likely will be found. All linings do not develop marked pockets but most of them do cut out rather abruptly just below the middle inwall and if the lining is developing a disintegrated or crumbled condition, the entire lining may fall out at that point. An illustration of this is shown in Fig. 3.

Disintegration of refractories and the action of carbon monoxide in iron blast furnaces have been studied by a number of investigators, among whom are Sir Lowthian Bell, Pattison, Firmstone, Lurmann and Osann. These various investigators have advanced explanations to account for the peculiar behavior observed.

A considerable amount of data has been reported from the study of the reactions of carbon monoxide with various metals and oxides. Sir Lowthian Bell found ferric oxide was deoxidized by carbon monoxide accompanied by a deposition of carbon at all temperatures between 150 degrees Cent. and a bright red heat. Deoxidation and carbon deposition were at a maximum at about 417 degrees Cent. Bernhard Osann found that when iron ores were subjected to carbon monoxide between 430 and 500 degrees Cent. carbon was deposited. While Osann did disintegrate a few fragments of bricks, he was interested primarily in the reduction of iron ores and did not apply his finding to bricks.

The presence of unusual amounts of various substances, found in the analy-

From a paper presented at the New York meeting of the American Iron and Steel institute May 25. The authors are research engineers, Carnegie Steel Co., Pittsburgh.

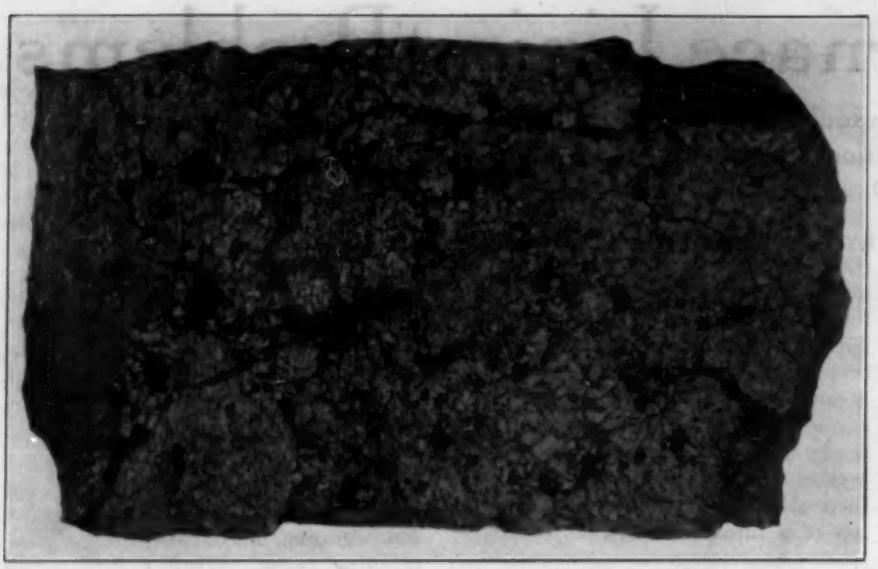


FIG. 2—BRICK DISINTEGRATED IN SERVICE. THE EFFECT OF LOCALIZED IRON IN THE ORIGINAL BRICK IS SHOWN BY THE CARBON DEPOSITS AROUND EACH IRON SPOT

sis of bricks after service, has been offered to account for their failure. Some experiments have attributed disintegration to the presence of zinc and lead or their oxides. Apparently neither lead nor zinc cause failure by disintegration. These metals often are found in bricks, but mainly in the cracks already opened by disintegration or in the joints between the bricks. In the case of lead, it is principally found in globules in the metallic state. The retorts and condensers used in the zinc industry do not disintegrate, although they absorb zinc to a much greater extent than any bricks in a blast furnace lining. The presence of alkalies has been suggested as a cause for disintegration, but the alkalies are volatilized by the furnace heat and combine with the bricks where the temperature is high and where there is little, if any, disintegration. Bricks taken from used linings have shown more than 10 per cent of alkalies and were not disintegrated.

Brick Composition Is Unchanged

Furnace bricks do change in composition in service. In the accompanying table a number of analyses of fire bricks, before and after service, are shown. The samples after service were taken from the highly heated end of the bricks after about 3 inches from the inner face of the brick had been removed. While these bricks had undergone a marked change in ferric oxide and alkalies, and had absorbed carbon, none was disintegrated. Analyses of bricks from the center or cooler portion of the lining showed little change in composition other than having absorbed carbon, yet examination showed they were disintegrated. The fact that disintegrated bricks are darkened in color by the presence of carbon, and that where most highly colored the most disintegration occurs, points to the importance of studying the source from which the carbon is obtained. If a brick contains free or loosely combined ferric oxide, large volumes of carbon will be deposited when carbon monoxide is passed over the bricks between certain temperature ranges. When this reaction is carried on within the body of a brick a disruptive force is produced sufficient to fracture the brick. Such a reaction would produce all the characteristics of brick failures in furnace lining. It remains, therefore, to determine in what form the iron must exist, and the conditions most favorable for carbon deposition.

Ferroalloy Lining Disintegrated

In the examination of a furnace which had been run on ferroalloys for 16 months, the lining was found to be badly disintegrated from the top to the bottom. The zone of disintegration could be traced distinctly from the top of the furnace, where it was only a few inches back from the inner

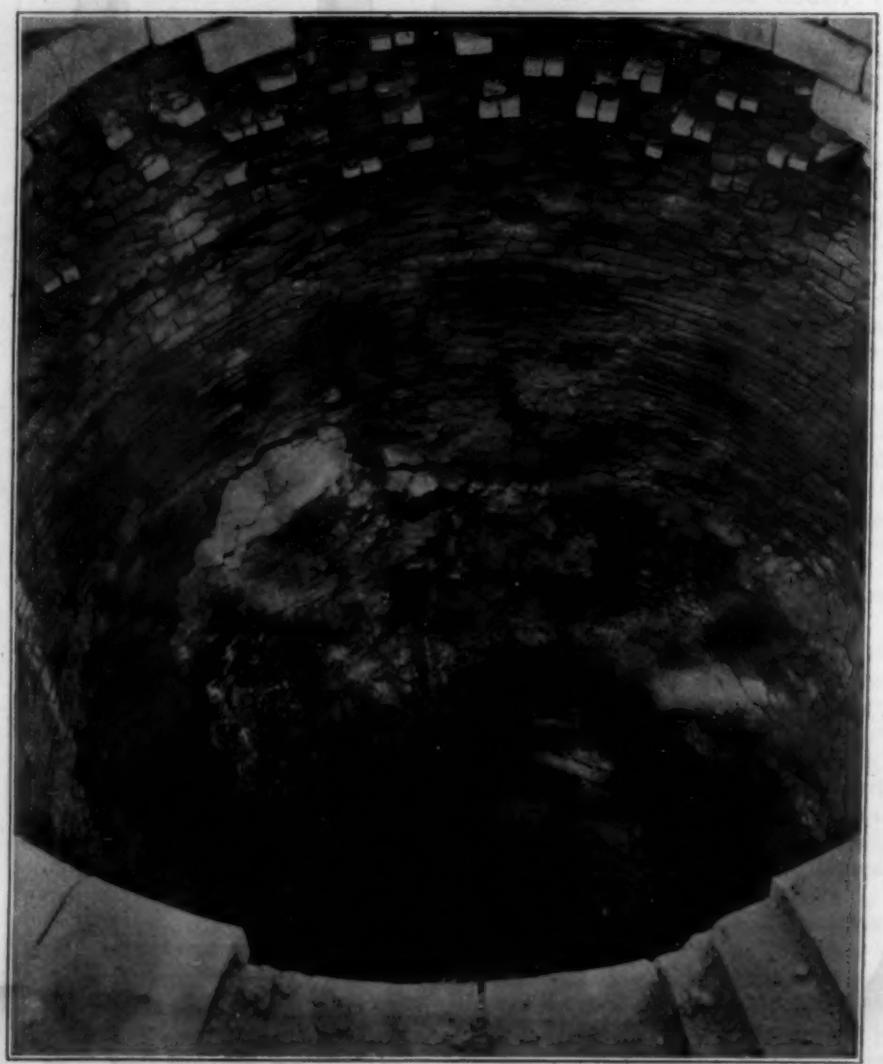


FIG. 3—A VIEW LOOKING DOWN INTO THE BLAST FURNACE AFTER IT HAS BEEN BLOWN OUT. THE DISINTEGRATION IS SHOWN PLAINLY

face, to the lower levels where it was 35 inches from the inner face at 55 feet from the top of the furnace. Such a condition pointed to the importance of temperature as affecting disintegration. In addition, the carbon monoxide in the ferro furnace was 50 per cent higher than in an iron furnace. We believed the concentration of the carbon monoxide had an important influence on the rate of disintegration.

Method of Conducting Tests

To produce disintegration in the laboratory we began by exposing bricks to blast furnace gas from a few minutes to several hours and at temperatures from 350 to 1000 degrees Cent. We also made some experiments using steam and hydrogen alone, but none of the experiments gave promising results. We learned later in the experiments with carbon monoxide or with blast furnace gas that considerably longer exposures were required with careful regulation of the temperatures between 420 and 470 degrees Cent. It was found that when using blast furnace gas containing from 20 to 25 per cent of carbon monoxide the action on the bricks was slow. If a gas containing 90 per cent of carbon monoxide was employed, a brick susceptible to disintegration could be shattered in from 6 to 10 hours.

Tests were begun by passing the gas over ferric oxide contained in glass test tubes. It was found that carbon could be deposited in a short time upon the oxide at temperatures beginning a little above 300 degrees Cent. The rate of deposition increased with increasing temperatures up to 500 degrees Cent. when the rate decreased and almost stopped at 525 degrees Cent. The greatest carbon deposits were obtained by slowly raising and lowering the temperatures between 420 and 470 degrees Cent. Carbon deposits have been built upon small amounts of iron ore by this means during a 10 hour exposure, until the resulting volume was approximately 70 times that of the original ore. Fig. 4 shows the effect of exposing pure ferric oxide, contained in test tubes, to carbon monoxide for varying periods of time at a temperature of 450 degrees Cent., and illustrates the increase in volume which may be obtained with even comparatively short periods of exposure. In studying the reaction resulting in the deposition of carbon, the ferric oxide appears to be reduced to a lower oxide or possibly spongy metallic iron. The oxide, or the reduced products, acted as a catalyzer, breaking up the carbon monoxide by the reaction $2CO=CO_2+C$. The reduced oxides or metallic iron are in an unstable state and seem to exist only in a certain form at a temperature range which is so narrow that it can not be constantly maintained without great difficulty. This supposition is borne out by the fact that a much larger carbon deposit can be obtained by fluctuating the temperature over a narrow range. When carbon monoxide is passed over ferric oxide at the proper temperature, the oxide quickly turns black and, if cooled in an atmosphere of carbon monoxide, is found to contain magnetic iron and carbon. If, however, it is cooled rapidly in the air it glows

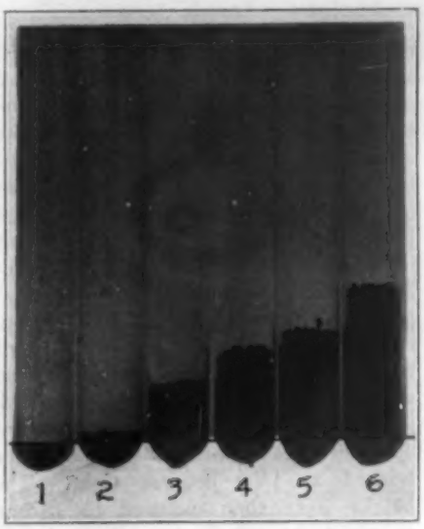


FIG. 4—INCREASE IN CARBON PRODUCED BY PASSING CARBON MONOXIDE AT 450 DEGREES CENT. OVER 0.5 GRAM OF FERRIC OXIDE. NO. 1 IS ORIGINAL FERRIC OXIDE; 2, AFTER 15 MINUTES; 3, AFTER 30 MINUTES; 4, AFTER 60 MINUTES; 5 AFTER 90 MINUTES; 6, AFTER 180 MINUTES

like burning soot and ferric oxide and magnetic oxide and carbon are found.

To test regular full size bricks, a rectangular cast iron box sufficiently large to hold twelve 9-inch bricks was made. The box was equipped with a close fitting cover which could be sealed gas tight with refractory cement. Gas pipe connections enabled gas to enter at the upper corner of the box and escape at the diagonally opposite lower corner. The sealed box could then be placed in a gas fired furnace and uniformly heated while the carbon monoxide gas was being passed through it. The carbon monoxide was prepared by generating carbon dioxide by the action of hydrochloric acid on limestone and then passing this gas over red hot charcoal in a tube in a combustion furnace. By this means a steady stream of dry carbon monoxide could be maintained. A typical analysis of the gas entering and leaving the disintegrating chamber is as follows:

	Entering, per cent,	Leaving, per cent
Carbon monoxide	92	51
Carbon dioxide	2	29
Hydrogen	3	10
Nitrogen	2	10

A study of the effect of ferric oxide or other iron compounds necessitated the preparation of special brick with known amounts of ferric oxide or such compounds as may be converted into ferric oxide in burning the bricks.

Two first quality clays, free from visible iron or foreign material, one from Pennsylvania and the other from Kentucky, were used in making a mix for typical blast furnace inwall brick, and various percentages of iron in the form of ore, ferric oxide or pyrites were added to the mix. The iron ore series was the most complete, the following percentages of ore by weight being added: 0, 0.025, 0.100, 0.250, 0.500, 1.00, 1.50 and 2.00 per cent. The mix with pure ferric oxide contained 1½ per cent of added oxide, and the mix with iron pyrites, 1½ per cent of added pyrites. The addition in each case was ground to pass a 20-mesh screen and remain on a 40-mesh.

The bricks were molded by hand to 9-inch size and dried. Part of the brick were burned in a test kiln, and a duplicate series in a large commercial kiln along with regular brick, for the purpose of comparison with those burned in the test kiln. The burned bricks of each kind were then subjected to carbon monoxide for 10 hours at 420 to 450 degrees Cent. The results from the bricks burned in test and commercial kilns were practically identical.

Ore Hastens Disintegration

In the series with added amounts of iron ore, there was no disintegration in the bricks without added ore, a slight cracking at 0.25 per cent, and a marked increase in disintegration with increasing percentages of ore, the last of the series being so badly shattered that it was almost impossible to handle them without the bricks falling apart. The bricks containing 1½ per cent of pure ferric oxide and those with 1½ per cent of iron pyrites failed practically in the same manner as bricks with corresponding amounts of iron ore. Test brick made from the selected clay without the addition of iron ore showed no disintegration after being subjected to carbon monoxide for 36 hours. Ordinarily commercial bricks placed alongside of these bricks failed completely in 10 hours.

Typical bricks of each were exposed

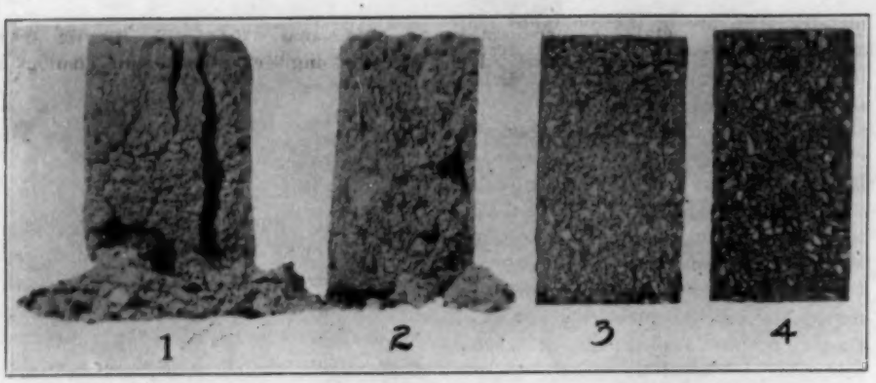


FIG. 5—EFFECTS OF THE TEMPERATURE OF BURNING COMMERCIAL BRICKS. 1 AND 2 ARE SOFT BURNED BRICKS SUBJECTED TO CARBON AT 450 DEGREES CENT. FOR 3 HOURS. 3 AND 4 ARE MEDIUM TO HARD BURNED BRICKS SUBJECTED TO CARBON MONOXIDE AT 450 DEGREES CENT. FOR 6 HOURS

to the action of blast furnace gas. The bricks showed the same results as with concentrated carbon monoxide, but required a longer exposure. The bricks failed under these conditions in from 3 to 10 days, depending on the amount of iron added. Ordinary commercial brick failed in 10 days as shown in Fig. 7. The bricks broken in either concentrated carbon monoxide or by longer exposure to blast furnace gas showed the same characteristic shattering, carbon spots and discoloration.

Tests Conducted With Ore

Examination of bricks which had disintegrated in service or had failed after being exposed to carbon monoxide indicated that the size of the impregnations had a pronounced effect on disintegration. To prove this, a series of brick was made in which the same amount of fine or coarse iron ore was added to select first quality fire clay. The fine ore was ground to pass a 100-mesh screen. The coarse iron ore consisted of particles that would pass through a 3-mesh screen and remain on an 8-mesh. In each case 1 per cent of iron ore was added and thoroughly mixed with the clay. The bricks were molded by hand in 9-inch sizes, dried and burned.

The bricks containing 1 per cent of fine ore were similar in appearance to a well burned first quality blast furnace brick. Those containing 1 per cent of coarse iron ore were spotted in appearance, these spots being partially fused but not wholly combined with the clay. After exposure for 10 hours to carbon monoxide at 450 degrees Cent., the bricks with fine ore additions showed nothing but small surface cracks and little change in appearance except a darker color. The coarse ore bricks failed by developing long irregular cracks. Each of the large iron spots at the surface and in the interior showed heavy depositions of carbon, and in many cases cracks were found radiating from these deposits.

Preliminary work with carbon monoxide showed that soft burned bricks disintegrated much quicker than similar bricks of a harder burn, indicating that the higher temperature used in burning had left the iron present in a condition not easily acted upon by carbon monoxide. Experimental bricks were made using first quality clay and an addition of 2 per cent of finely ground iron ore. After drying, part of the bricks were left unburned, part were burned in a test kiln at 1050 degrees Cent. and the balance burned at 1300 degrees Cent. The bricks were then exposed to carbon monoxide at 450 Cent. All the bricks burned at 1050 degrees Cent. failed from disintegration, while the unburned bricks and those burned at 1300 degrees Cent. were only slightly disintegrated.

The fact that unburned bricks are but slightly affected was also proven by other tests of unburned bricks containing various percentages of iron oxide, and by tests in which fire clay mortar with 2 per cent of added iron oxide was spread on commercial bricks and exposed to carbon monoxide. The bricks disintegrated, while the mortar was only slightly disintegrated around the iron spots. Similar conditions have been observed in removing a blast furnace lining after a campaign. The regular fire clay mortar used to lay the bricks shows little disintegration.

Tests on the effects of burn were also made on commercial bricks. A number of soft burned blast furnaces bricks were selected from stock, cut in halves, and one-half of each brick reburned at 1400 degrees Cent. When exposed to carbon monoxide at 450 degrees Cent., the half of the brick in its original condition was disintegrated, while the reburned half was but slightly affected. The effect of hard and soft burning on commercial bricks is shown in Fig. 5.

Comparisons of soft burned ladle and common red building bricks with similar bricks of a harder burn in the disintegration test also showed that the soft burned bricks failed, while the harder burned bricks of each variety were only slightly damaged. Hard burning can not be considered a method for prevention. The real cause of disintegration is the iron in the clay, and the way to prevent disintegration is to keep contaminated clay out of the bricks, not by burning the bricks at a temperature high enough to combine the iron with the clay.

The tendency will be to burn all bricks hard. This may prevent disintegration to some extent, but will result in the failure of the bricks from other causes. Hard burning makes a brick sensitive to thermal changes, and there will be excessive spalling, particularly in such locations as the top of the blast furnace, where the bricks must stand rapid changes in temperature due to cold charges coming in contact with the heated brickwork.

Studies Method of Manufacture

In testing commercial bricks, it was found that the manner of making the bricks, whether augur made, steam pressed or hand molded, had considerable influence on the ease with which the bricks were disintegrated. The augur made bricks, being laminated by the way in which they are made, fractured along the lines of weakness. Steam pressed bricks usually failed by the brick splitting lengthwise. Hand made bricks fractured irregularly. Some difference was observed in the disintegration of coarse and fine ground brick, the fine ground brick disinte-

Analysis of Bricks in Furnace Service

	Before service	After 5 years' service; distance from top of furnace		
		55 feet	65 feet	75 feet
Sample	1	2	3	4
Silica (SiO_2)	57.64	44.74	44.70	41.40
Ferric oxide (Fe_2O_3)	0.71	2.88	3.14	3.75
Alumina (Al_2O_3)	41.17	34.25	36.35	34.23
Lime (CaO)	0.32	1.46	2.50	0.70
Magnesia (MgO)	0.24	0.20	0.31	0.18
Titanium (TiO_2)	....	2.11	2.11	1.98
Potassium (K_2O)	0.62	4.91	7.97	6.90
Sodium (Na_2O)	0.10	7.82	1.83	6.16
Carbon (C)	....	0.25	0.85	4.58

grating to a slightly greater extent.

To show that the disruption of a brick is due to mechanical force exerted by deposited carbon, a chrome, magnesite, silica and a fire brick were drilled with a ½-inch hole extending to the center of each brick. Two grams of iron ore was placed at the bottom of each hole and the holes plugged with refractory cement. On account of the strength and density of chrome and magnesite brick, additional holes were drilled one inch from the end of each brick and treated in the same manner. The bricks were then subjected to the test and, with the exception of the magnesite, all were cracked. The magnesite and particularly the chrome bricks contain considerable iron in combination with their other elements, but apparently this combined iron did not have any influence on disintegration.

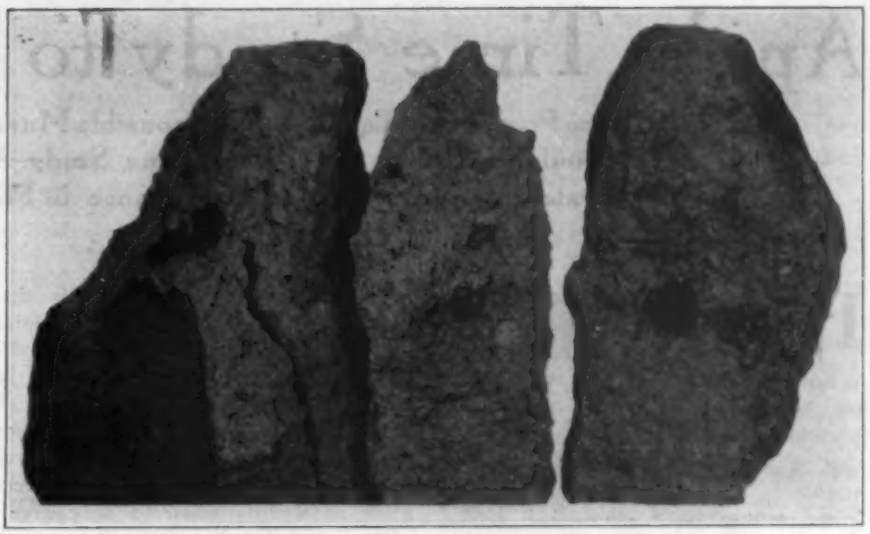


FIG. 7—COMMERCIAL BRICK DISINTEGRATED BY BLAST FURNACE GAS AFTER 10 DAYS EXPOSURE

Determining Disintegration Resistance

Producers and consumers, by the use of the disintegration test, have at hand a ready means of determining the resistance of abrick to disintegration. If bricks of unknown properties are put through the test, and a brick of satisfactory properties be included for the purpose of comparison, results can easily be obtained in 10 hours which will show whether the unknown brick has sufficient resistance to disintegration to be used in a blast furnace lining.

Bricks used in blast furnaces making iron can not be protected from furnace gases. This gaseous atmosphere can not be changed. Some of the gas will penetrate the bricks. If these bricks contain free ferric oxide, the carbon monoxide in the furnace gas will react with the ferric oxide and deposit carbon. To prevent disintegration effectively, the bricks must be free from uncombined iron oxide. Such bricks can be made only from clays free from these compounds.

This ideal condition rarely exists and provision for sorting out undesirable compounds must be provided. The almost universal practice of taking the clay direct from the mine to the yard should be stopped. Separating the iron compounds from the clay by washing, screening and grinding is not practicable. The only practical remedy is to weather the clays in a layer not over 2 feet thick for at least two months. Sufficient space to insure the necessary supply for this period must be provided. If the weather is dry, the layer must be watered weekly. This treatment will oxidize the iron compounds, which will be apparent by a change to a brown or yellow color. Such lumps or patches must be discarded and only the unstained clay used. Should the clay slake or break up readily, it should be turned over with a plow or some mechanical means to expose the under side and the sorting repeated after weathering.

Hard Burning a Poor Remedy

A medium burn is all that is permissible in a blast furnace brick. Hard burning is at best a poor remedy for the disease. It reduces the sensitiveness of the brick to disintegration, but injures it by increasing the susceptibility to rapid changes of heat. These conditions exist at the furnace top, in the hot blast mains and stoves. The real cure is to use clay which is naturally pure. When such clay is not available, the clay should be freed from objectionable iron compounds by such treatment as will yield commercially iron-free clay.

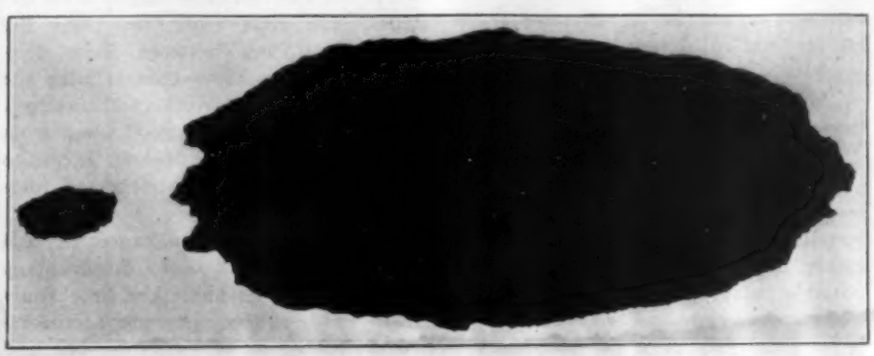


FIG. 6—COMPARATIVE INCREASE IN VOLUME OF FERRIC OXIDE AFTER 10 HOURS TREATMENT WITH CARBON MONOXIDE GAS. ORIGINAL VOLUME OF FERRIC OXIDE AT LEFT; REDUCED PRODUCTS AND DEPOSITED CARBON AT RIGHT

Studies Monel Metal for Lamp Gauzes

Following an inquiry into the practicability of using monel metal for flame safety lamp gauzes, the bureau of mines of the department of the interior announces these conclusions:

"The investigation showed that monel metal is a satisfactory material for flame lamp gauzes. Monel metal gauzes provide as great a degree of safety in gaseous and coal dust laden mixtures as do steel gauzes, and, in addition, they do not corrode perceptibly in humid atmospheres.

"Monel metal gauzes maintained their shape and stiffness under the greatest heat to which they were subjected in gaseous mixtures equally as well as steel gauzes did; this together with the fact that they do not corrode perceptibly in humid atmospheres should assure a much longer life for monel metal gauzes.

"It is believed that the use of monel metal gauzes in flame safety lamps would be a step toward greater safety and that their use should be encouraged."

According to the bureau, material used for flame safety lamp gauzes should possess mechanical strength, resistance to corrosion under service conditions, a relatively high thermal conductivity, and a melting point above the ignition temperature of mine gas. Heretofore steel, brass and copper have been used for gauzes.

Apply Time Study to Steel Mills

To Standardize Production, Equipment Responsible Must Necessarily Be Standardized—Standards Set by Intelligent Time Study Are Absolutely Accurate—Workmen of Great Assistance in Making Survey

BY ROBERT GREGG

IN A general sense, time study is so well known that it has come to be a household word in industry. When we limit it to the steel industry, however, we run into many complications and differences, so great that it amounts almost to a separate science. The peculiar problems and broad requirements make it a higher type of engineering than in any other industry. For example, let us consider the stereotyped method of time study, which consists of timing a unit operation, calculating the number of such per hour, ignoring unnecessary delays, and setting up the resulting figure as a production standard.

In a steel mill, this phase of the work is only incidental and is confined largely to the various finishing processes. Actual practice often shows itself inconsistent with the most carefully constructed theory, and the only remedy yet found is to make due allowance next time in our theory.

The reason? It may be the effect of a great amount of the human element; of the excessive heat; of large units introducing a greater probability of error; of the impossibility of minute control in chemical processes; or, most likely, a combination of these and other factors. Certain it is, however, that time finds itself confronted with many problems which demand for their solution the services of men who know little about stop watches and a great deal about steel.

The result of the first efforts made to introduce this work into our plant clearly illustrates this point. We employed a company of high grade industrial engineering in the country, which installed a system which we still use altogether. But the system is all they furnished, for they knew their own profession and not steel. Their results were quite good where they involved only small units and finishing processes, these being the kind of material with which they were familiar; but wherever their work involved steel proper, it was worse than useless, for it made the science of time study an object of ridicule from which it has taken several years to effect recovery.

In attempting to overcome this distrust and to establish the principles involved, a class room course in personal efficiency was instituted, the results of which were highly beneficial. First, starting with some 12 major foremen, requiring daily classes of one hour duration each, the classes were made sufficiently small to be conveniently handled. In a few weeks this resulted in an entirely different mental attitutde towards the work of the time study department and really created a desire for the active assistance of the men of this department by the various operating superintendents.

Time Study Purposes

Time study has two aims; the first is arriving at satisfactory standards; the second, offering suggestions for improvements. By satisfactory standards is meant, primarily, production standard. It is our aim to know exactly what is the maximum capacity of every unit, and more especially to know what is the reasonably attainable output which can be expected day after day, barring undue mishaps. These standards may be determined with more or less accuracy by watching the performance of fairly good equipment handled by fairly good men. Under these ideal conditions, our results would be fairly dependable; under other conditions, they would be worthless.

The standards set by intelligent time study are absolutely accurate. If at some future time any wide variation between actual and standard production is observed, we may feel sure that conditions have changed. Such variation would be an effective warning to us to determine what these conditions are; if better, to keep them so, if worse, to change them back to those which formerly attained.

In standardizing production, we must necessarily standardize the equipment responsible. By this is not meant the installation of labor-saving devices, but rather the utilization to the very best possible advantage of the equipment we have already. For example, the recommendation of a cardumping system is not a part of our task, though the equipment of a machine with a simple guide to facilitate feeding, or the use of a better grade of steel in wearing parts, or the recommendation of an automatic stop for saving time, occupies a very important place. In other words, the expected return must be greater than the outlay for any expenditure of money to deserve a place in recommendations based on time study.

In the same manner, the standardization of production involves the standardization of personnel, and this phase shares equally with equipment in the attention of the time study man.

The second aim mentioned for time study, that of offering suggestions for improvement of practice, seems at first glance, a rather bold statement. When a comparatively green man sets out, and in a highly technical industry, to offer suggestions to men who have spent their lives in the work, it necessarily brings forth some skepticism and occasionally hostility, the combating of which demands a prodigious amount of tact. Nevertheless, many suggestions of real value are received in this way.

But perhaps of even greater importance than original suggestions are those ideas gleaned from the men who actually do the work. These are the ones who know most minutely and forcibly the details that need correction. They have the advantage of being in constant and intimate contact with their jobs, but lack the education, the freedom, the perspective, or the expression to change what they know to be wrong. The management, on the other hand, has most that the workman lacks, but due to this very fact, it cannot stay in close touch with details. The time study man fills the well-defined gap between these two. He stays in as close contact with the work as to do the workers themselves. He must sort out the good ideas from the bad, and then present them to the management as concisely and forcibly as possible.

In addition, both management and men labor under one disadvantage which does not trouble the time study man. This is that they are accustomed to seeing things as they are and have been a sort of mental inertia which is often the cause of enormous industrial crimes. The efficiency time

From a paper presented at the American Iron and Steel institute meeting in New York, May 25, 1923. The author is president of the Atlantic Steel Co., Atlanta, Ga.

study man goes on a job with the assumption that everything is wrong until proven right, being very careful, of course, not to let anyone else suspect his attitude. It is surprising, sometimes ridiculous, what malpractices have been discovered in this way.

Open-Hearth Department

This department is almost entirely technical. Therefore, if any beneficial results can be obtained here, it is safe to say that the same should be possible in any branch of the steel industry. Such results actually have been obtained, though to a less extent here than elsewhere, it must be admitted. In the less technical aspects of the open-hearth, however, much more has been accomplished.

The method of attack was to keep a minute log of the furnaces together with all auxiliary equipment which might affect their output. By this means were uncovered many delays, mostly mechanical, which were then analyzed and traced to their sources. The greatest delay was found to be on the charging machine. Analysis indicated that there was insufficient inspection and that the design of controllers was too flimsy.

The furnace personnel knew, of course, that these faults existed. The management knew also; but they did not have the specific information as to how many minutes per day were lost and what was the exact nature of the trouble. The following are some of the other faults which were brought to notice during the same study:

1. Hydraulic equipment was sluggish, due to clogged pipes and worn pipes.
2. Hydraulic piping was exposed and often broken by falling scrap.
3. Leaks existed in the building roof, directly over the furnaces.
4. The scrap pans were badly stocked.
5. Powdered coal burners were too fragile and too hard to clean.
6. Various equipment, valves, ladle stands, motors, etc., were insufficiently protected.

Steps were taken to correct all of of these conditions in accordance with the recommendations.

This department is less technical than the open-hearth, and the results of time study have been correspondingly more specific. The same sort of study was made on the rolls, and an enormous loss appeared due to faulty heating. Curve 1, in the accompanying chart shows what was happening. Early in the morning the steel was overheated and rolled easily, quality being sacrificed thereby. During the course of the day, the steel became continually colder and the minutes per ingot rose rapidly.

The recommendations based on the study were:

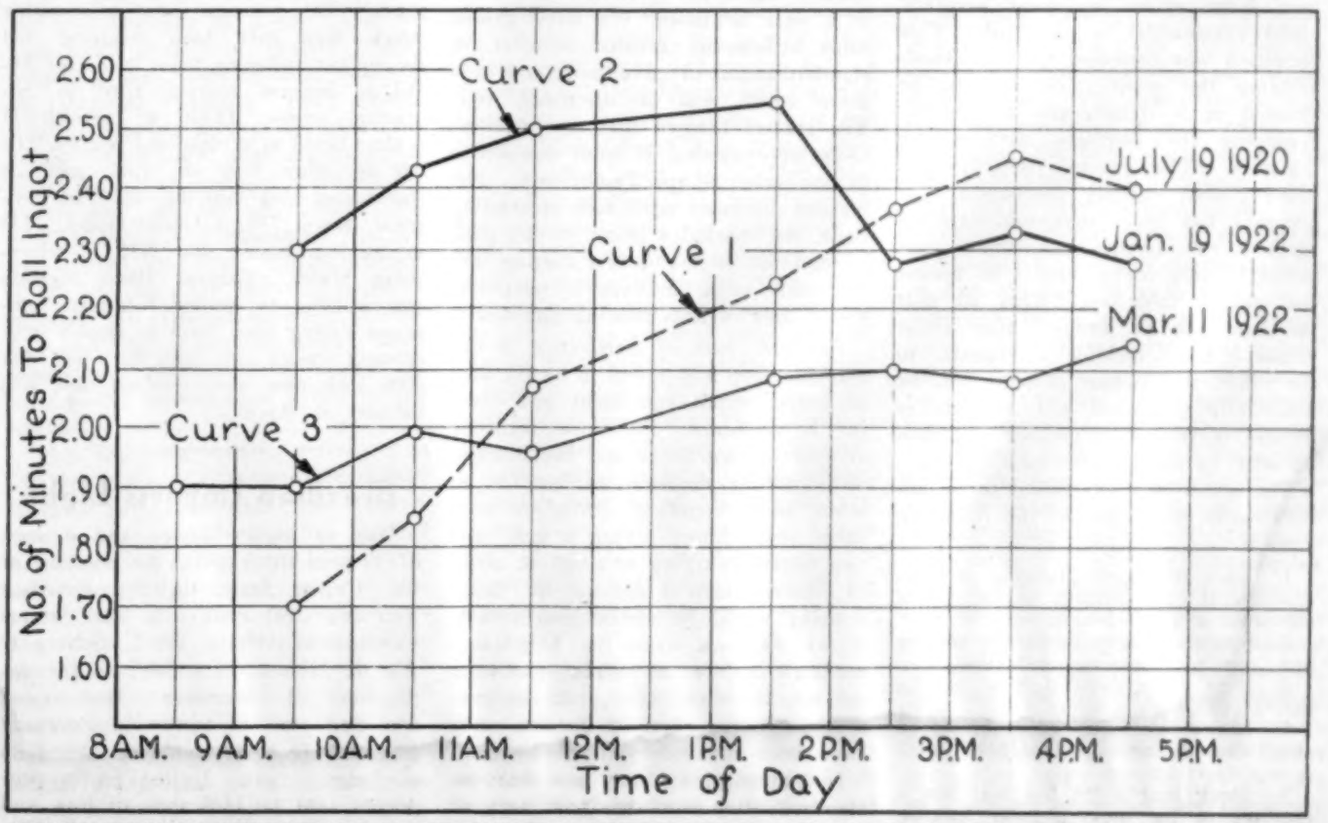
1. Equip all soaking pits with efficient air-control.
2. Install water-cooled division walls.
3. Charge ingots differently so as to place 12 to 14 ingots in each pits, instead of 10.

These recommendations were all carried out and are now being used. In addition, the mill management, surprised at the conditions shown in the study, began to take vigorous steps to improve general heating practice. The result is shown in Curves 2 and 3 of the accompanying illustration. The only quality of these curves to be considered here is their average slope. Their relative height depends on other conditions, some of which will be explained later.

Tasks Are Combined

The study further showed that four men in the mill could be eliminated by combining jobs. The first set was the door boy and the ingot car operator. Both of these were idle the greater part of the time, but the doors had to be closed at the same time that the ingot car started off. The door boy might be at any one of four places, while the car operator was always at one place. The suggestion involved the installation of four levers for the latter, all on the same shaft, but each beside one of the door controllers, by which arrangement it was a simple matter for one man to operate the two jobs simultaneously.

The second pair to be combined were the jobs of ingot transfer operator and soaking pit crane helper. Both men were essential to the opera-



CURVES SHOWING MINUTES PER INGOT REQUIRED FOR DIFFERENT TESTS USED IN TIME STUDY OF BLOOMING MILL PRACTICE

tion of the mill, though each was busy only about 22 per cent of the time. One was stationed upon an inaccessible platform so that he could not change quickly enough from one location to another, but a stairway in the position was recommended as a simple means of overcoming this difficulty.

A similar case was found in the flying-shear scrap laborer and the cooling bed operator. Neither job was arduous, and each was so disposed as not to conflict with the other. This combination likewise involved the moving of three controllers to a more convenient location. The fourth man eliminated was one of two extra pulpit men. This one had been put on during the boom which followed the war, while men were demanding easy jobs.

In the merchant bar warehouse the time element is not of first consideration. Of greater importance are space and accuracy and it is to a large extent with these that most of our standardization work has been concerned.

Bar Counting Made Accurate

A great many complaints had been coming in due to errors in counting bars. On investigation, it was found that these bars were sheared in varying numbers per stroke and counted by laborers. The process therefore was entirely mental, and was done by men from whom no great accuracy could reasonably be expected. This condition was remedied first, by standardizing the number of bars to be sheared at a stroke, and second, by equipping the counters with proper registers. The process thereby was made almost entirely mechanical and accuracy has been correspondingly increased. A further refinement proposed in this connection is to mount the gaging table on hinges so that the bars can be dumped after shear stroke. By attaching a register to the table, the human element will be practically eliminated and one laborer instead of two as at present will then be able to operate the table.

The scrap loss was found to be unnecessarily high, due to the following causes:

1. Lack of proper planning of most economical combinations of bar to be cut from a given length.
2. Sluggish operation of cooling bed, due to defective lubrication.
3. Bars being dumped from cooling bed at too high a speed.
4. Large bar rolled from billets so small that the average length left over is too short to use.
5. Stock length for bar was not a multiple of the most popular lengths. That is, the bar was sheared 55 feet long for stock, whereas 20 to 40 feet were by far the most popular lengths. Forty feet was therefore recommended as the proper stock length.

Hoop Mills Benefited

An interesting state of affairs was shown up by time studies on the rolls and roll-hands on different sizes of hoop. A study of the averages obtained revealed the fact that on all sizes of hoop, the down-side rougher was busy almost continually. On the larger sizes, however any other part of the mill could handle from 50 to 100 per cent more.

From this it appears that the mill production is limited by the speed of one man, the down-side rougher. The remedy for this was to split his work between two hands, one to handle the first and second passes, and the other to handle the third. An idea of what would occur may be gained from the results, taken on a smaller hoop. In this, the third pass was handled by a repeater, and an examination of the various parts shows that they were almost perfectly balanced. This condition was actually brought about on larger sizes by the means suggested. The billet heating furnace then became the pacemaker of the mill, which alone shows that the practice was improved.

Repair shops in general do not lend themselves very readily to standardization of output, the reason being, of course, that a job may not recur once in a year or more. We have gained some satisfactory results, however, in standardization of conditions, and it is these which will be discussed here. The studies showed that our machine tools were cutting at from one-fourth to one-eighth of the Taylor rate. The reasons disclosed were, lack of instructions, the machines being in too poor a condition to stand fast cutting and the tools being improperly tempered, due to lack of heat treating facilities.

Another cause of inefficiency in our machine shop was found to be the lack of proper small equipment and tools for the machines. There was recorded a delay of two hours and five minutes on a milling machine waiting for an arbor to be repaired. Another man spent seven hours during a gear cutting operation trying to adapt an arbor to cutters which it did not fit. Such a delay would be almost unbelievable if we did not have the stop-watch readings before us. The particular job may be done again, but the general conditions revealed by the study have been invaluable.

In summary, we may say that our standardization work has paid back all that it cost plus a good profit. Not only has it paid, but it has done so under conditions about as adverse as could be imagined. One of these adverse conditions has already been discussed—the exacting requirements of the steel industry.

Next in magnitude has been the attitude of many of our personnel in the past. It is only human for a man who has fought his way to a position of responsibility by hard work to resent any seeming interference with his authority. In the early days such opposition occurred often and violently. Gradually, as we were able to convince them that we intended no immediate harm, their attitude became one of passive acquiescence. This was as bad as the first, however, for any time study work demands not only the assent, but the enthusiastic support of the line executives in order to be successful.

Asks Employment of More Trained Veterans

General Frank T. Hines, director of the United States veterans bureau, in an address before the Chamber of Commerce of the United States at New York, called upon the industrial leaders of the country to assist the government in placing at work over 600,000 incapacitated war veterans. The average length of training of the exservice men now receiving instruction, is two and one-half years. The principal lines of training which they have been receiving and the number following those lines are: 20,763 in business courses, 1,168 in mechanical trades, 11,410 in agricultural trades, 12,618 in professional courses, 11,549 in other lines of work such as shoemaking and tailoring, 8650 in electrical trades, 7500 in metal trades, 3555 in building trades, and 2775 in advertising trades. General Hines recently sent a letter to leading industrial companies calling upon them to employ government trained men, with the result that 3000 such men were received back into industry in April.

Brazilian Imports Light

Due to higher prices and a lack of surplus for export, the position of the United States in the Brazilian iron and steel market is weak, states Commercial Attache W. L. Schurz at Rio de Janiero, in a cable to the department of commerce. Imports of iron and steel at Santos in February totaled 7011 tons, including 2259 tons of Belgian rails. United States producers sent in 1228 tons of iron and steel in February.

Electric Mill Drive Is Efficient

Bar Mill Equipment Installed in East Chicago Plant Nearly Two Years Ago Has Shown Satisfactory and Economical Operation—Slow-Speed, Direct-Drive Motor a Feature—Main and Auxiliary Apparatus Is Described

BY HENRY E. DAVIS

THE merchant bar mill of the Interstate Iron & Steel Co. located at South Chicago, Ill., was placed in operation on June 4, 1921. This mill comprises an 18, 16, 14 and 12-inch continuous merchant mill, designed and built by the Morgan Construction Co., Worcester, Mass., to roll alloy steels in sizes ⅝ to 3 inches in diameter, or equivalent sections of squares and ovals, also flats 1½ to 6 inches wide with a minimum thickness of 3/16 inch. The mill is served by two Morgan-type gravity-discharge, reversing continuous heating furnaces with hearths about 34 x 13 feet. These furnaces are fired from three 10-foot gas producers.

The roughing mill consists of two 18 inch and four 16-inch stands and is what might be called a combination of a continuous and a semicontinuous roughing mill. There are electrically driven connecting tables between stands Nos. 1 and 2, Nos. 2 and 3, and Nos. 4 and 5, but no connecting tables between Nos. 3 and 4, or between Nos. 5 and 6, the last four stands being tied together in pairs. This arrangement permits a shorter overall length of the roughing mill, which is advantageous because the reduced time in handling allows for higher finishing temperatures than if connecting tables had been installed between the stands that are tied in pairs. However, it has the disadvantage that the mill is full with four billets, whereas if the stands were not tied together it might be possible to work six billets and the maximum power peaks would occur less frequently though the total power consumption would remain about the same.

This roughing mill is driven by a 1500-horsepower, 2200-volt three phase, 60-cycle, 78 revolution per minute, wound rotor, induction motor through bevel gearing. The first four stands are connected to one end of the motor and the last two stands to the other end, a breaking spindle and thrust collar being used in both cases between the mill lineshaft and the motor-shaft.

Before deciding on a 78 revolution per minute motor, a 450 revolution per minute motor with gear speed reducing set was considered. The 450 revolution per minute motor would require less floor space and have a higher power factor. In efficiency and reliability the comparison was about equal. The gear reducing set would add an extra unit to the drive that would require attention and consume power. The cost of the slow speed motor was less than the combined cost of the high speed motor and gear set, and in the author's opinion the slow speed motor provides a simpler, more reliable and more economical drive.

Finishing Mill Described

The finishing mill consists of six stands, two 14-inch alternate intermediate stands, and four 12-inch staggered duo stands. Steel leaving the the last, or No. 6, stand of the roughing mill is transferred broadside to No. 7 stand, the first stand of the 14-inch mill, and is again transfered to No. 8. From here it is carried by transfer or repeater to the first stand of the 12-inch mill. The repeater is easily moved into position and is used when rolling small sizes. From the first or No. 9 stand of the 12-inch mill the steel is delivered onto a special skew roll table, which delivers it in proper position to the next pass. The three remaining, or Nos 10, 11 and 12 stands are connected with the same type of tables. When rolling light sections such as spring steels, the skew tables are not used, provision being made in the table construction to allow for land looping from stand to stand.

The finishing mill is driven by a 2000 horsepower, 250 to 150 revolutions per minute, 2200-volt, single-range, Kraemer set, which is direct coupled to stands Nos. 9 and 11. Stands Nos. 7 and 8 are driven by belt. Stands Nos. 10 and 12 are driven by belt. A thrust collar and breaking spindle are provided between the motor and driving pulley.

The question of driving this mill with a single-range Kraemer set was not settled without considering the double-range Scherbius set. One of the advantages of the Scherbius set is in being able to operate at speeds above or below the base speed, whereas with the Kraemer set it is possible to operate only below the base speed. For our application the base speed of the Scherbius set would have been 200 revolutions per minute and in event of injury to any of the regulating equipment it would have been possible to roll, at 200 revolutions per minute, sections that could not be rolled with the Kraemer set. It would also have been possible to roll, at a reduced tonnage, any of the sections that could be rolled with the Kraemer set.

These advantages of the Scherbius set were not considered of sufficient importance, however, as against the advantages of the Kraemer set. The Kraemer set consists of three standard machines, an induction motor, a direct-current motor and a rotary converter, which have been developed for reliable operation, and with which the average mill electrician is familiar. An intimate knowledge of the characteristics of any particular machine is essential in maintaining continuous operation.

Motor rooms of brick construction have been provided for the main drives. Removable roofs allow for the use of the mill cranes in case repairs are necessary. The floors are covered with an insulating mastic compound eliminating the usual dust and grit of a cement floor; and providing a surface that is easy to keep clean. The necessity of rubber mats is eliminated.

The drives are under the supervision of one operator on each turn; he is stationed in the finishing mill motor room. All master controllers, as well as the maximum torque push buttons for both motors, are conveniently located in this room. The maximum torque push buttons permit the cutting out of the first three resistance points when necessary, which is not unusual in starting up if the mill is cold, or in backing out a cobble. Emergency stop buttons are located out in the mill and, since on different occasions one or the other of the motors stopped without any apparent cause, these buttons were sealed with paper, making it impossible to operate them without breaking these paper seals. This precaution clearly indicates in the case of a stopped motor whether the motor was stopped from the button or other

From a paper presented at the New York meeting of the American Iron and Steel institute, May 25. The author is chief electrician, Interstate Iron & Steel Co., Chicago.

causes. There are, no doubt, other methods of accomplishing the same results, but this method is reliable and economical.

In starting up the mill, the roller signals by an electric horn located in the power room, the speed at which he desires to roll. The operator, after repeating back the signal by an electric horn located at the finishing stand, starts the finishing mill motor. The several resistance points are cut out step by step until the motor is brought automatically to high speed or 250 revolutions per minute. If the mill is to operate at lower speed, the rotary converter is started, and through proper manipulation of the field rheostats of the rotary converter and direct-current motor, the mill is brought to the desired speed by observing an electric tachometer mounted above the rheostats. When the starting of the finishing mill motor is completed, the roughing mill motor is started, automatically coming up to full speed as each point of the starting resistance is cut out. Starting the finishing mill motor first avoids the possibility of steel being put through the mill while the operator is adjusting the speed. The total time consumed in starting both motors to full speed is but 56 seconds, and an additional 9 seconds is required in adjusting the speed to 200 revolutions per minute on the finishing mill drive motor. The end clamps are fastened with through bolts.

The mill drive motors with their control were supplied by the Allis Chalmers Mfg. Co., Milwaukee. These motors are of rugged construction and are especially adapted for the heavy steel mill service. The yokes have a deep section and rigidly support the core by means of dovetails integral with the punchings and end clamps. The end clamps are fastened with through bolts.

Water Cooling Not Necessary

The stator coils are diamond shape in form, wound and insulated with 4000-volt, class *A* insulation, and are lashed and braced in place to prevent distortion under heavy overloads or when plugging. The stators are arranged for sliding parallel to the shaft to allow for making repairs. The rotor spider has I-beam section arms, the construction of the core being similar to that of the stator. The bearings are heavy mill type ringoil and arranged for water cooling. This last feature, however, was not found necessary.

The control furnished with the motors is the direct-current operated, magnetic type arranged for plugging. It is built for hard service and all parts requiring renewal are accessible. The secondary control panels with the resistance and the forward and reverse solenoid operated oil switches are located adjacent to each motor. The main oil switches are automatic, with overload and undervoltage protection, and are electrically interlocked with the rest of the control and, in the event of their opening automatically, they cannot be closed until the master switch is brought to the off position.

Control Equipment Described

Located in the finishing mill motor room and under the supervision of the motor operator, are two 500-kilowatt motor-generator sets, a 20-kilowatt exciter set, a 66-kilowatt frequency changer set, and a 13-panel switchboard, all being supplied by the General Electric Co., Schenectady, N. Y.

The motor-generator sets furnish 230-volt direct current for the auxiliary motors and traveling cranes. The sets are tied in with the plant power station and, in emergency, power can be used from either station. This also makes it possible to shut down either station on Sunday. The frequency set consists of a 110-horsepower, 230-volt, shunt wound, 430 to 780 revolution per minute motor, direct connected to a 66-kilowatt 70 to 130-volt, alternating-current generator, and furnishes the power for 93 motor-driven rolls, description of which is given later. The switchboard consists of six panels for the control of the alternating-current circuits, a totalizing meter panel in the center, and six panels on the other end for the direct-current circuits. All panels are of natural black slate, 90 inches high and 2 inches thick, and with the oil switches are mounted on pipe frame work.

The oil switches are located about 8 feet to the rear of the board, but are manually operated from the front. Mounted on each panel are the usual indicating meters with a watthour meter for each circuit. Mounted on the totalizing panel are a graphic wattmeter, voltmeter and power factor meter, in addition to the indicating meters and watthour meter. These meters are all connected to the 12,000-volt side of the plant power supply and serve as a check against the power company's meters. The primary panels for the motor drives also have graphic wattmeters. In the author's opinion the graphic wattmeter is one of the most important requirements in a motor installation such as this, and if it is closely observed will assist in preventing electrical and mechanical delays on any installation. The operators are instructed to watch the graphic meters, especially on the main drives. Upon observing any unusual rise of the mill friction load by the increased demand of power on either motor, or noticing any sudden increased demand of power when steel is being rolled, the operator notifies the mill superintendent or roller.

Besides taking care of the main drive motors, the operator, takes care of all the other equipment in the motor rooms. He takes hourly power consumption readings and records mill stops. At the end of each 24-hour period these records are analyzed and from them the power required to roll a ton of any particular grade of steel can be computed. The graphic chart readings are taken at the end of each turn, making it easier to compare the power required in rolling grades of steel by the different mill crews.

It is found, in rolling certain grades of alloy steel, that if there is steel in all stands of the roughing mill at the same time, the motor is occasionally overloaded to such an extent that it pulls out, or the circuit breakers let go. With this condition existing and in order to avoid interruption on the finishing mills, it is necessary to rely on the table operator not to fill all passes at the same time. The lack of power in motor drives for steel mills may not be the general rule but neither is it the exception; there are times in the operation of nearly every mill when for a short period of time, it is necessary to roll at a rate much in excess of the average rate that can be continuously maintained. Motors should be provided which will drive the mill at the maximum capacity for this period at repeated intervals without injurious heating.

Motors Are Inspected Regularly

An air washer built by the Spray Engineering Co., Boston, is located between the motor rooms and supplies 25,000 cubic feet of air per minute under 2-inch static pressure through concrete tunnels to the motor pit, circulating up through the motors. The motors are inspected and blown out with compressed air every Sunday, and twice a year the stator is slid over, the whole motor receiving a general going over and a coat of paint. Inspecting the motors and blowing them out generally takes a day, so that one motor is done one Sunday and the other the next. The oil is changed in the bearings at the same time and this has been the only expense on the roughing mill drive to date. The same is true of the finishing mill drive with the exception that, due to heavy overloads, the rotary converter has

run hot, throwing solder out at the risers of the commutator. The same brushes that came with the machines are still in service and the collector rings have not had any work done on them. Being able to keep the same motor operator on the job since the mill started has helped considerably in holding down the expenses chargeable to the motors.

Cooling Bed a Feature

An interesting part of the mill is the hot runout table and cooling bed. From the finishing mill to the cooling bed the 33 table rollers are individually driven by ½-horsepower motors. The rolls are the standard cylinder type and are placed on the end of the rotor shaft, making the motor and roller a complete unit, which is bolted to the side of the table. Throughout the length of the cooling bed cone rollers are used, individually driven by ¼-horsepower motors. Each cone roll, with its motor, is swiveled on a vertical arm so that the angle of the roll can be changed as desired. In operation, a bar traveling along the table travels on the high part of the roll until it reaches a position at which it is desired to place it on the cooling bed. At that instant the motors are shifted and the bar is carried broadside across the face of the rolls to the small end of the cone, reducing the traveling speed to a point where it is easily lifted off and into the first rack of the escapement bed. These motors are alternating-current, adjustable speed 210 to 390 revolutions per minute, built by the General Electric Co., Schenectady, N. Y., and their power is furnished by the adjustable frequency motor-generator set in the finishing mill motor room.

The speed at which the small motors operate is adjusted, in accordance with the speed of the finishing mill drive, by the operator, who, at the starting of the mill also starts the 93 motors by starting the frequency set. Each motor has fuse protection. They are connected to the power supply in groups of 10 and 11, and instead of connecting 10 motors in a row to a circuit every third motor is connected to the same circuit. This was done so that, if trouble occurred on any one of the circuits, it would stop only one motor out of every three. Stopping one roll would not tie up the mill, but stopping three or more in a row might. These motors require but little attention, this usually consisting of blowing them out with compressed air once a week, and an occasional oiling. Bearing trouble developed when the mill was first started up, but this trouble has been eliminated.

The cooling bed is 300 feet in length and is a combination of an Edwards-type inclined gravity escapement bed and a horizontal notched bed, and, with the packing device, was designed especially for the accurate slow cooling of alloy spring steel bars. The packing device consists of a series of jointed bars fastened to shafts which are operated through worm gearing by a 12-horsepower motor. The jointed bars are spaced three feet apart throughout the length of the bed and are located between the inclined and horizontal portions of the bed. When cooling spring steel while the packing device is in operation, the steel in leaving the inclined bed slides down the jointed bars of the packing device into the first notch of the horizontal bed then by slightly raising the pointed bars the following steel bar slides down on top of the first bar, the same operation being carried on after each bar until there is a full pack in the first notch. The jointed bars are then lowered to the starting position. The horizontal portion of the bed advances the pack by lifting and carrying it from notch to notch until it is deposited on the shuffle bars which arrange the pieces of the pack in proper position for shearing.

Control Equipment Concentrated

All auxiliary motors except those on the hot runout table are 230-volt, direct-current and were supplied by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The reversing motors are the totally enclosed type, the nonreversing being of the semi-enclosed type. All auxiliary motor control is of the full magnetic type manufactured by the Rowan Controller Co. All of the control equipment is concentrated in three balconies, located one at each end of the mill and one in the center. The center balcony is directly opposite the finishing mill stands and makes a convenient pulpit for the three transfer and table operators who have between them 14 master switches for controlling the travel of the steel through the finishing mill. The other master switches are conveniently located for the control of the different operations. By grouping the master switches of the four tables of the roughing mill and adding a solenoid to operate the clutch on the billet dividing shear it is possible to get along with but one operator, the table operator now being able to operate the shear.

This auxiliary control was selected because of its principle of operation and its simplicity. The principle of operation is that of acceleration, mainly by time limit under a secondary influence of current limit. This scheme aids materially in producing a control board with no complication such as small relays, etc. The selection has stood the test of nearly 2 years of practical operation and the results have justified the choice.

Four Cranes Are Provided

The four electric traveling cranes were furnished by the Morgan Engineering Co. These four are: Two 15-ton, 102-foot span, three-motor, single hoist cranes for the mill repairs and shipping; one 10-ton, 80-foot span, three-motor crane for charging the furnaces and handling the billets in the storage yard; and one 5-ton, 22½-foot span, four-motor, bucket handling crane for coal, ashes and mill scale. This last mentioned crane is located in the gas producer building. Coal is unloaded from the cars to the coal pit or crusher and from there to the gas producers. Adjacent to the coal pits is a concrete scale pit, into which the mill sewers are drained, the scale being dug out of the pit and loaded into cars by the crane.

All the electrical equipment in the mill, excepting the main drive and its control is looked after by a motor inspector and helper on each turn. The helper is also the operator of the gas house crane. The electrical delays on the auxiliary equipment, including cranes, averaged for last year 22 minutes per month. In the almost two years that the mill has been in operation, only two armatures have been changed, and these on account of bearings, one being on a gas producer, the other on a crane. A motor inspector plays an important part in the electrical organization of any steel plant. Having one who has enough interest in his job to give it the required attention, will reduce electrical delays to a minimum.

Power is purchased from the Commonwealth Edison Co, Chicago, at 12,000 volts and is stepped down to 2300 volts volts by three 1667 kilovolt-ampere, single-phase transformers. Previous to the building of the present mill, power was received from the same source, coming in through a looped line, and while a satisfactory kilowatt-hour rate was obtained, the power interruptions were inconvenient. To overcome the interruptions, the power company installed from its new station, which is located approximately three miles away, an underground line, coming direct to the substation. The mill is the only customer on the line. This made a favorable arrangement; the chances of a long power interruption are not much greater than if the mill had its own

power plant; and furthermore a favorable rate is obtained.

The water supply is obtained from a pump house, located on the river bank aproximately 2500 feet from the mill and was put in operation with the new mill. Three 4,000,000 gallons per 24-hour capacity centrifugal pumps were installed. Two of these are sufficient to supply the plant requirements, the third being maintained as a spare. Two of the pumps are directly connected to 125-horsepower, 2300-volt, 1700-revolution per minute induction motors, and the other to a 125-horsepower, 230-volt, direct-current, 1700 revolution per minute motor. No attendant is necessary in the pump house as the two alternating current, motor-driven pumps automatically cut in and out, governed by the water level in the stand pipe. The other pump is started automatically from the finishing mill motor room by the operator upon receiving a signal indicating low water.

The mill is well lighted by a liberal supply of 500 and 750-watt, 110-volt, mazda lamps with deep cone reflectors. The power supply for these is obtained through three 33 1/3 kilovolt-ampere transformers. The fixtures are mounted on the roof trusses and a substantial platform walk runs full length through the center of the mill and along each side, providing easy access for cleaning and replacing lamps.

Eastern Manufacturer Combines Plants

WITH the recent removal of its sales and executive offices to its South Brooklyn plant located at the foot of Fifty-third street on the east shore of upper New York bay, the E. W. Bliss Co. now occupies a group of 17 buildings, covering a ground area of 18 acres and having a total floor area of 21 acres. The plant has a water frontage of 390 feet at which there are two piers, one being 200 feet long and 80 feet wide and the other 575 feet long and 60 feet wide. There is sufficient water to accommodate the average size steam ship.

During the war many large additions were made to the plant to meet war requirements until it reached its present proportions. At the termination of hostilities considerable space and equipment was available. The company believed that the consolidation of its Brooklyn plants had decided advantages and accordingly has moved practically all the machine equipment from the Adams street plant to the South Brooklyn plant, using the space made available by the dismantling of the special machinery necessary for war requirements.

This plant is reached by the Brooklyin rapid transit Fourth avenue subway, a station being located at Fifty-third street and Fourth avenue, Brooklyn, also by the Brooklyn rapid transit Fifth avenue elevated, the terminal of which is the New York side of the old Brooklyn bridge. On this line the nearest station to the plant is what is known as the Fifty-second street station, Brooklyn. The offices, located on the corner of Fifty-third street and Second avenue, are but a few minutes walk from either the subway or elevated.

The plant is 5 feet less than one-half mile long. Beginning at the Second avenue end of the plant there is a 3-story machine shop, 320 x 200 feet, constructed in the form of a hollow rectangle, the court of which is 200 x 80 feet and is used as erecting shop, while the balance of the building is used as a machine shop. The erecting shop is served by a number of electric traveling cranes and auxiliary hoists. On either side of the building are 5-ton steel cranes to serve the planers and lathes.

Back of this is the hydraulic forge shop which is a 1-story building 125 x 200 feet and is served with two 10-ton and one 30-ton overhead electric traveling cranes. The equipment in this shop consists of furnaces, steam hydraulic forging hammers and forging presses ranging from 200 to 1000 tons pressure. The water supply and pressure is obtained by eight hydraulic pumps, each being driven directly by one 350-horsepower electric motor which in turn supplies two 16-inch 200-ton accumulators. The pumping equipment is controlled by an automatic switchboard.

Loading Is Done In Yard

Next in order is the automobile die department, a 1-story concrete building 200 x 180 feet. A storage yard having a railroad siding completes the space in the block between Second and First avenues. This yard is used chiefly for loading and unloading of cars serving the group of buildings above described, a 5-ton locomotive crane being used.

On the far side of First avenue is a 1-story brick and steel building 320 x 200 feet. This building is fitted with numerous skylights, giving an ideal lighting condition. Between this and a 7-story building are various minor buildings such as plating, pickling, grinding, and small tool houses, also two 100,000-gallon fuel oil storage tanks. This is the primary supply of oil for the boilers and furnaces used throughout the plant and is fed by a main line running from the pier to these tanks so that they may be filled directly from the barges.

In the rear is the 7-story machine shop and erecting shop. The machine shop is a brick and steel building 380 x 60 feet. The first two floors are served by 5-ton overhead electric travelers, both the lower stories having been made sufficiently high to accommodate these cranes. The entire building is used for manufacturing purposes.

Immediately to the left and adjoining this building is the main erecting shop, having an 801-foot span and being 380 feet in length with a clear overhead height of 50 feet, and in which are housed all of the large planers up to and including those having 12-foot capacity and 26-foot stroke. The main erecting floor and the machine tools are served by four overhead electric traveling cranes, two of 50-ton capacity and two of 30-ton capacity, each being equipped with auxiliary hoists.

Beyond this building and up to the bulkhead line is the main foundry which is 240 feet long and 180 feet wide. The foundry obtains its iron from two 84-inch and 54-inch diameter cupolas. The equipment includes three oil-fired core ovens 20 feet wried, 30 feet deep and 10 feet high sand mixers, jolt ramming machines and 4-ton wall traveling cranes. In the center of the foundry is a water prooied pit, 60 feet long, 14 feet wide and 10 feet deep, which is used for making deep castings. This foundry being built at tidewater level, it was necessary to construct such a pit to exclude water from the molds. About half way between Second and First avenues is a half block line of various minor shop buildings, including a garage.

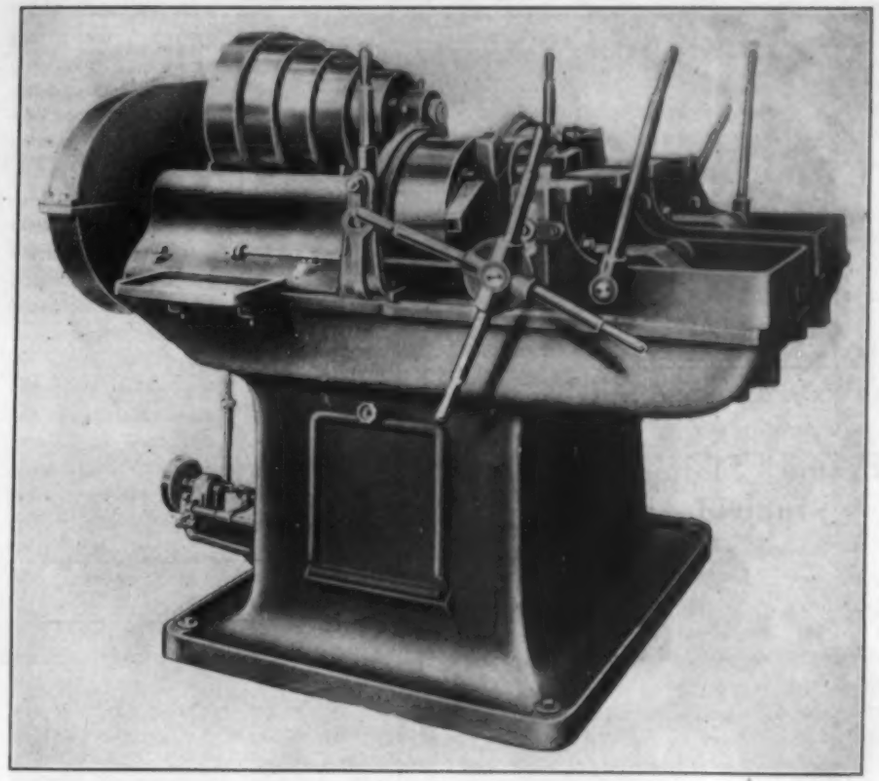
Again across First avenue are housed various departments including blacksmith and drop forging shops, pipe shop, lathe department, machine shop, coppersmith shop and various other general machine working departments. Farther front is the steam power plant and high pressure air equipment, also a salt water pumping station which gets its supply from New York bay from a 36-inch main. Salt water is used for condensing purposes and flushing and cooling throughout the plant. This station also includes one 1000-gallon electrical and one 1000-gallon steam fire pump which is connected to the sprinkler systems throughout the entire plant. For fire supply the pumping capacity is equivalent to 5000 gallons per minute. The fire system is further provided with two 4-way connections on the pier bulkhead for connection with fire boats.

Builds Pipe and Nipple Threading Machine

A pipe and nipple threading machine with internally tripped die heads, recently has been introduced by the Landis Machine Co., Waynesboro, Pa. The new machine employs an internally tripped die head, which it is claimed, insures a uniform length of thread on the nipples, and eliminates the necessity of gaging each nipple by hand. The accompanying illustration shows a front view of the improved machine which will thread, ream and chamfer pipe and nipples.

In the internally tripped die head, the knurler collar and the clamping rod are integral. The clamping rod is threaded at one end, this end screwing into a tapped hole in the shank of the reamer. The spider has a square hole through it and is tapped part of the way to fit a tube, which is threaded and screws into the spider. The reaming portion of the hole in the spider is plain to afford a bearing for the driver. The driver has a square hole at the end to receive the shank of the reamer. The reamer is set at the desired position by drawing the knurler collar tightly by hand, thus clamping together in one unit the tube, driver and reamer. The reamer is adjusted for length by unscrewing the clamping rod and turning the collar to the left.

This new machine employs long life high speed steel chasers and chamfering reamers. The machine is built in the ½, 1¼, 2 and 4-inch sizes, single and double types.



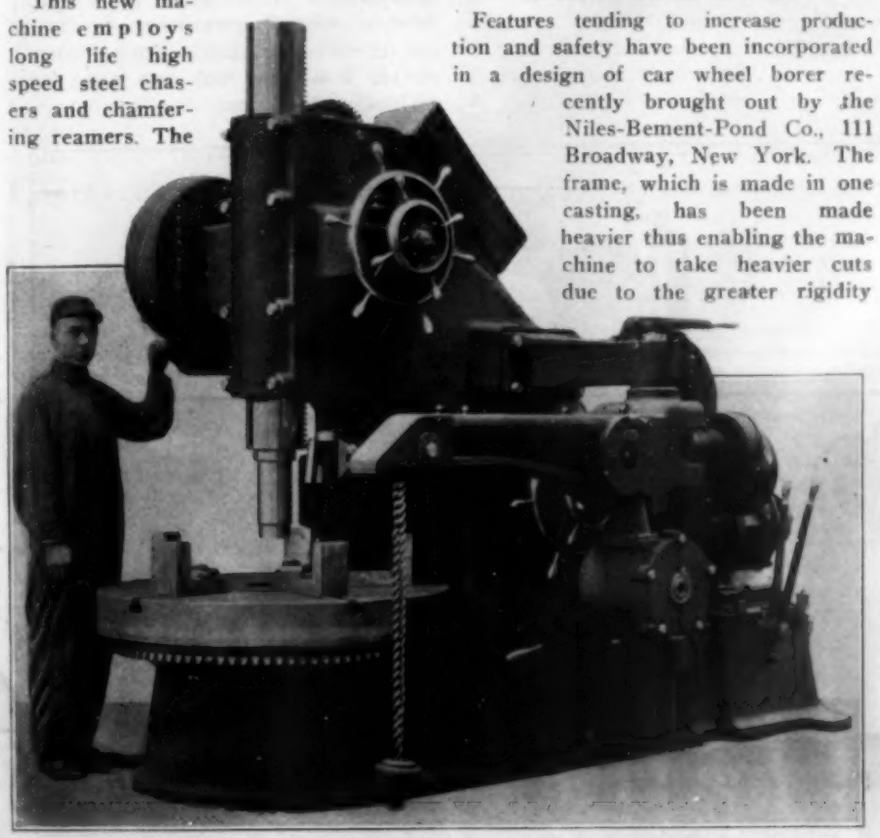
THREADING MACHINE HAS INTERNALLY TRIPPED DIE HEAD

Safety Features Built in Car Wheel Borer

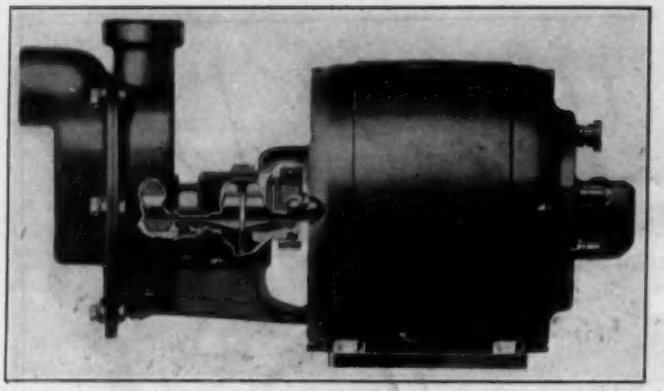
Features tending to increase production and safety have been incorporated in a design of car wheel borer recently brought out by the Niles-Bement-Pond Co., 111 Broadway, New York. The frame, which is made in one casting, has been made heavier thus enabling the machine to take heavier cuts due to the greater rigidity gained with the increased weight. The pattern of the frame has been altered in such a way as to give greater support to the hub facing bar. An automatic self centering chuck has been made a part of the equipment of this machine.

After the wheel to be bored has been swung into place on the table by means of an electric motor driven crane supplied with the machine, the motor driving the machine is started in the regular way. A mechanism in the table causes the chuck jaws to move inward until they engage in the wheel tread. After the job has been properly chucked, the table is rotated, the driving force employed in the cutting operation helping to lock the wheels tightly in place. Reversal of the motor after the completion of the cut causes the jaws on the chuck to loosen and withdraw toward the periphery of the table. The removal of the work is accomplished with the crane.

Where a shop is equipped with direct current, dynamic braking may be used. For either direct or alternating current the machine uses reversing motors. The different table speeds are obtained by using a variable speed motor in the case of direct current and a constant speed slip ring motor operating through a speed change box where the alternating current is used. No clutches are used in either case. The machine can be furnished for belt drive if desired.



CAR WHEEL BORER HAVING AN AUTOMATIC SELF CENTERING CHUCK



CENTRIFUGAL PUMP HAVING RING OILED PACKING GLAND

Frame Slotter Employs Individual Drive

A locomotive frame slotter having a new type of drive recently has been introduced by the Niles-Bement-Pond Co., 111 Broadway, New York. Formerly the reversing motion of the machine was accomplished by means of a crank and connecting rod or through the use of reversing pulleys and belts for transmitting power to the rack and cutter bar. The new design uses a reversing motor mounted on each head. This motor drives through only one set of gears and rotates a vertical screw which directly engages the outer bar.

The motors used are of 20-horsepower with a 4 to 1 speed range. The outing and return speeds are controlled independently and any combination between them can be obtained within the speed ranges of the motor. The dials on the contactor panel are connected with rheostats which govern the two speed functions. The desired cutting speed is set on one and the return speed on the other. The motor is reversed by automatic contactors governed by a pilot switch which is actuated by the tripping of adjustable dogs on the cutter bar. Another feature of the machine is found in the feed arrangement. Each head has its own motor for feeding and traversing the head along the bed and the saddle along the cross rail. The control and operation of both feed and traverse is electrical. The dial set at a desired feed point allows the feed motor to take one or more revolutions intermittently. The throwing of a switch allows the motor to run continuously giving fast traverse of either head or saddle as desired. These machines are built with from one to three heads and in any desired length of bed. The machine shown in the accompanying illustration has a bed length of 60 feet, each head being self-contained and independent in every way.

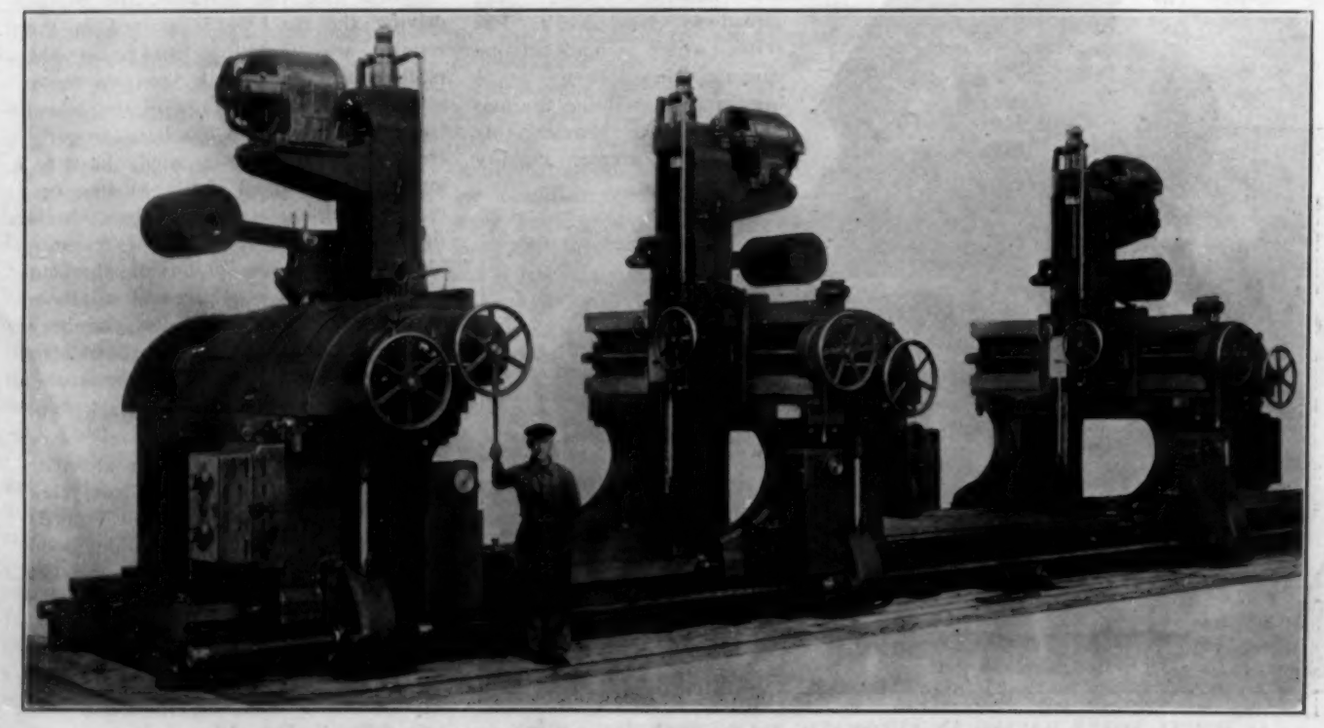
Steps will be taken at once looking toward the reorganization of the Holmes Automobile Co., according to Clarence G. Herbruck, counsel for bondholders who acquired the plant May 21.

Builds Centrifugal Pump with Motor Drive

The Arrow Pump Co., Detroit, has incorporated a ring oiled packing gland feature in a motor driven centrifugal pump. While the unit may be used for a number of purposes, its chief effectiveness is found in the circulation of the cutting lubricant for machine shop cutting tools. A sectional view of the packing installed in a pump unit is shown in the accompanying illustration.

The new construction protects the bearings from coming in contact with the liquid being pumped and provides a positive supply of oil with the ring oiler. A priming chamber enables the pump to retain its prime and work within the suction capacity above the level of the supply without the use of mechanical prime retainers. The pump unit is compact, requires no base and can be assembled for floor or side wall mounting. Since both motor and pump bearings are ring oiled from large oil wells, the unit may be located in isolated places where little attention will be given.

Among the additional specifications which have been submitted to the American Engineering Standards committee for comment and criticism, prior to their formal adoption by the federal specifications board, which drafts specifications for all government purchases, are the following: Steel castings; foundry pig iron; and high test gray iron, or semisteel castings.



LOCOMOTIVE FRAME SLOTTER DRIVEN BY MEANS OF REVERSING MOTORS AND ONE PAIR OF GEARS

Loader Is Mounted on Standard Tractor

For use in loading sand, coal, etc., in various parts of the foundry, the N. P. Nelson Iron Works, Inc., Fortieth street, Brooklyn, N. Y. recently has introduced a self feeding bucket loader which is mounted on a standard Fordson tractor The new loader is capable of traveling around the plant at a speed up to 12 miles per hour. A view of the self propelling type loader is shown in the accompanying illustration.

The operator stands on a platform at the side of the machine with all control levers in reach and with an unobstructed view of the entire digging and loading operation. Another feature of the new development is the fact that the elevator is direct connected to the engine, allowing the elevator to run full speed while the tractor is inched backwards into the disappearing pile. The spirals level a six foot cut and material once started in motion keeps moving until picked up by the buckets. An overload release gives the operator ample warning of boulders or undiggable material.

The capacity of the machine is 40 yards of material per hour, handling material that can be shoveled without the use of a pick. A governor controls the consumption of fuel to the actual requirements. A swivel spout it attached to the loader permitting discharge sideways into a truck if necessary An 8½-foot clearance is provided under the discharge chute.

Compares Cutting Rates of Tool Steels

Comparisons of performance of modern high speed tool steels in "lathe breakdown" tests are described in a paper being issued by the federal bureau of standards at Washington. The paper deals not only with the endurance of tools under definite working conditions but also with the limitation of this method of testing when applied to the purchase of steel. The more important results of the bureau's tests are:

1. Breakdown tests are not satisfactory as the basis of purchase for tool steels.

2. While competitive comparisons of brands of nearly similar performance are not justified, owing to the qualitative nature of this type of test, relatively large differences may be ascertained with certainty, provided sufficient tools are tested and averages of at least two grinds are used in interpreting the results.

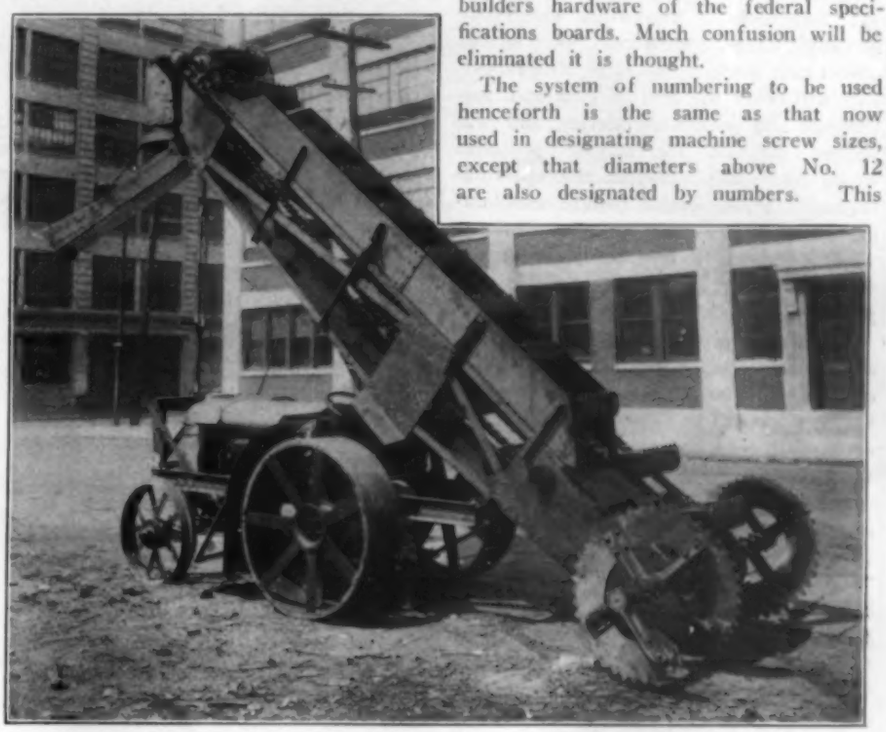
3. In certain severe breakdown tests with roughing tools on 3 per cent nickel steel forgings in which high frictional temperatures were developed, it was found that the performance of commercial low tungsten-high vanadium and cobalt steels was superior to that of the high tungsten-low vanadium type, as well as special steels containing about ¼ per cent uranium or ¾ per cent molybdenum. The average power consumption in all cases was practically the same so that this factor need not be introduced in comparisons which may be made on the basis of the endurance of the tools.

4. Modification of test conditions, including small changes in tool angles but principally changes in the cutting speed more markedly affected the performance of steels containing cobalt or special elements, such as uranium or molybdenum, than the basic types, such as plain chromium-tungsten-vanadium steels.

5. The relatively poor endurance of high tungsten steels under severe working conditions was not observed in more moderate tests which were made on the same test log with equal cutting speed and depth of cut, but with reduced speed and in which the frictional temperatures produced were not so high. Also, in these latter tests the performance of the cobalt steels was better than either the low or high tungsten steels.

6. Hardness determinations and examination of fractures indicate that the various types of commercial high speed steel show differences in behavior under heat treatment and in physical properties which probably are of importance under moderate working conditions and might counterbalance slight advantages in performance.

The average quotation of 12 industrial stocks in Vienna, Austria, increased 35 per cent during April.



SELF FEEDING BUCKET LOADER WHICH MAY BE MOVED UNDER ITS OWN POWER

Adopt Standard Sizes for Wood Screws

At least two systems of numbering wood screws to designate the diameter have been used in the past, methods of measuring lengths have been at variance and the number of threads per inch for a given size have not been the same for different makes. All this confusion has been eliminated and the dimensions of wood screws made uniform throughout the United States as the result of a co-operation agreement among the manufacturers, the bureau of standards, and the technical committee on builders hardware of the federal specifications boards. Much confusion will be eliminated it is thought.

The system of numbering to be used henceforth is the same as that now used in designating machine screw sizes, except that diameters above No. 12 are also designated by numbers. This means, for example, that a No. 10 wood screw will have the same diameter as a No. 10 machine screw. Uniform methods of measuring diameters and lengths, and uniform tolerances in diameters and lengths were adopted together with a standard angle for the under side of the heads of flat and oval head screws.

The number of sizes of brass and steel screws manufactured as standard were reduced from 555 to 291, a reduction of 47 per cent, and at the same time a sufficient variety was retained to answer every need. This reduction should benefit the manufacturer, the dealer and the user. The above standards have been incorporated into a United States government specification for wood screws, officially adopted by the federal specifications board for use in all government purchases of wood screws, and issued as bureau of standards circular No. 140.

Late News of the Societies

Notes on Past and Coming Meetings of National and Local Trade and Technical Organizations

CONSIDERABLE interest has been aroused in the iron and steel exhibit to be held at the Buffalo auditorium, Buffalo, N. Y., Sept. 24-28 under the auspices of the Association of Iron and Steel Electrical Engineers. Numerous exhibitors already have contracted for space; others have made reservations. The exposition will cover the field of electrical, mechanical and power engineering and will present methods for solving problems which continually confront the operating engineers whose duties require maintaining the continuity of operation at all times. This is especially true today, when the demands so far exceed the available supply.

A tentative program has been arranged as follows: A specification covering the construction and operation of automatic engine stops will be presented for the recommendation of the association by Walter Greenwood, chairman of the safety committee; A. C. Cummins is preparing a paper covering blast furnace skip hoists; D. M. Petty will present a paper covering "Slip Regulators." He will also bring before the organization the recommendations of the motors committee with respect to ball and roller bearings in motors; E. C. Seibert, combustion engineer of the Bethlehem Steel Co., will present a paper on a combustion subject; B. A. Cornwell will present a paper covering "Electircally Operated Motor Driven Centrifugal Pumps"; E. T. Moors will present a paper covering "Electric Furnaces;" Dr. D. S. Jacobus will present a paper on the subject of "Waste Heat;" "Complete Electrification of the Foundry Industry" will be covered by L. W. Egan; "Electric Heating Furnaces" will be the subject of a paper to be presented by an author whose name will be announced later; a paper covering the processing of steel will also be presented; "Electric Transportation" by F. O. Schnure will deal with the cost of operating an electric locomotive in the Bethlehem Steel Co.'s plant at Sparrows Point, Md. The usual committee reports also will be presented including the combustion committee and the standardization committee.

* * *

To Discuss Safety Measures

The engineering section of the National Safety council will meet at Detroit, June 12, for its second meeting of the year. Safety in welding and cutting by the electric, gas and thermit methods wil be considered at the morning session and industrial sanitation and health work in the afternoon.

The program is as follows:

MORNING SESSION

General Topic—Gas and Electric Welding and Cutting

Safety in Electric Welding and Cutting.

Safety in Gas Welding and Cutting—C. F. Worfolk, Michigan State Automobile School, Detroit.

Safety in Thermit Welding—C. D. Young, Metal & Thermit Corp., Chicago.

Eye and Face Protection for Welders and Cutters (with demonstration of effect of various kinds of glass in cutting down visible and invisible rays)—G. A. Kuechenmeister, Dominion Forge & Stamping Co., Walkersville, Ont.

Round Table Discussion.

AFTERNOON SESSION

General Topic—Health and Sanitation

Cutting Down the Time Lost on Account of Illness—Dr. F. G. Barr, Medical Director, The National Cash Register Co., Dayton, Ohio.

Discussion led by Dr. Guy L. Kiefer, Medical Director, Michigan State Telephone Co., Detroit.

Prevention of Infections from Cutting Oils and Compounds.

Discussion led by Sanford DeHart, director, hospital and empolment department, R. K. LeBlond Machine Tool Co., Cincinnati, O.

"Paying the Price"—a new first-aid film, shown by courtesy of the Travelers Insurance Co.

DINNER MEETING

Safety Work that Pays Dividends—A. H. Young, International Harvester Co., Chicago; past president, National Safety council.

Preventing Street Accidents by Law Enforcement—Judge Alva R. Corlett, Cleveland.

* * *

Corrosion Is Discussed

Methods of solving the corrosion problem in connection with coal mining were discussed by George M. Enos at the bi-monthly meeting of the mining section, Engineers' Society of Western Pennsylvania, Tuesday evening, May 29, at the William Penn hotel, Pittsburgh. Lantern slides added to the interest of the paper which was entitled "The Problem of Corrosion in the Coal Mining Industry." Mr. Enos is junior metallurgist of the United States Bureau of Mines, Pittsburgh.

* * *

Foundry Research Described

Research work as applied to different branches of foundry practice was described from personal experience and observation by Jesse L. Jones before the regular monthly meeting of the Pittsburgh Foundrymen's association, held Monday May 28, at the General Forbes hotel, Pittsburgh. Mr. Jones is chief chemist in charge of the physical and chemical testing department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Officers for the ensuing year were elected at this meeting as follows: President, John W. Guay, Fort Pitt Steel Casting Co., McKeesport, Pa., to succeed Samuel B. Cuthbert; vice president, Ralph W. Jones, Union Switch & Signal Co., Swissvale, Pa., secretary-treasurer, William J. Brant, Bessemer building, Pittsburgh, re-elected. The new executive committee is composed of the following: Samuel B. Cuthbert, Carnegie Steel Co., Braddock, Pa.; L. B. Snow, Hickman-William Co., Oliver building, Pittsburgh; Gustav A. Bauman, Jones & Laughlin Steel Corp., Pittsburgh; B. F. Mercer, Union Steel Casting Co., Pittsburgh, and L. V. Stevens, Locomotive Stocker Co., Pittsburgh.

* * *

Discusses Mining Problems

"The Problem of Corrosion in the Coal Mining Industry" was the subject of a paper presented by George M. Enos, junior metallurgist of the United States bureau of mines, Pittsburgh, before the members of the mining section of the Engineers' Society of Western Pennsylvania, Tuesday evening, May 29. The paper was illustrated with lantern slides.

Convention Calendar

May 28-31—American Society of Mechanical Engineers. Spring meeting at Montreal. Calvin W. Rice, 29 W. Thirty-ninth street, New York, is secretary.

June 7—National Association of Sales Managers. Convention at Atlantic City, N. J. Charles F. Abbott, 26 Madison avenue, Montclair, N. J., is chairman.

June 7-9—The Taylor society. Annual meeting at the Hotel Onondaga, Syracuse, N. Y. H. S. Person, 29 W. Thirty-ninth street, New York, is secretary.

June 11-14—Electric Power club. Annual meeting, Hotel Homestead, Hot Springs, Va. S. N. Clarkson, Kirby building, Cleveland, is secretary.

June 14-15—American Society for Steel Treating. Spring sectional meeting, Hotel Bethlehem, Bethlehem, Pa. W. H. Eisenman, 4600 Prospect avenue, Cleveland, is secretary.

June 20-23—American Institute of Chemical Engineers. Summer meeting at Wilmington, Del. J. C. Olson, Polytechnic institute, Brooklyn, N. Y., is secretary.

June 25-29—American Society for Testing Materials, annual meeting at the Chalfonte-Haddon hall hotel, Atlantic City, N. J. C. L. Warwick, 1315 Spruce street, Philadelphia, is secretary.

June 25-29—American Institute of Electrical Engineers. Annual convention at Swampscott, Mass. F. L. Hutchinson, 33 West Thirty-ninth street, New York, is secretary.

Motor Fuel

Market Weaknes—Price of Benzol Declines—Other Prices Unchanged

New York, May 29.—Weakness has developed in motor fuel, and this in conjunction with the fact that production of coal tar by-products is the largest in history, has forced the market downward on pure and 90 per cent benzol. This is the first change in many weeks. Pure benzol is now holding at 27 cents works in tanks, and 32 cents in drums and 90 per cent benzol at 25 cents in tanks and 30 cents in drums, a decline of three and two cents respectively. Quotations on all other light oil distillates, however, are unchanged. Toluol continues to hold at 30 cents in tanks and 35 cents in drums; solvent naphtha, 27 cents in tanks and 32 cents in drums; and commercial xylol, 29 cents in tanks and 34 cents in drums. The shortage of tank cars and drums, noted recently, is no longer in evidence.

With contracting about over, the spot market on sulphate of ammonia is a trifle easier at $3.15 to $3.20 works, on domestic business and $3.55 to $3.60 port, in double bags, on export. Spot domestic buying is fairly good, but foreign inquiry is dull; in fact, for the past two weeks, there have been virtually no inquiries of importance from abroad.

Buying by the drug trade to supplement contracts placed some time ago, is a feature of the ball and flake naphthalene market, while the weather continues cool, and for that reason the cleaning season is not going ahead as actively as is usual at this time of the year. Prices are holding around 10 cents works for flakes and 11 cents for balls in carload lots and one cent higher in less than carload lots.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants in Tank Lots

Pure benzol	$0.27
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producers' Plants

Phenol	$0.24
Naphthalene flake	0.10
Naphthalene balls	0.11

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$3.15 to 3.20

Contract

Pure benzol	$0.27
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producers' Plants

Phenol	$0.24
Naphthalene flake	0.10
Naphthalene balls	0.11

Sheet Sales Decline 42.4 Per Cent in Month

Sheet sales in April declined 42.4 per cent as compared with March, or from 325,526 tons to 183,904 tons. Slight declines were registered in production and shipments in April from the March levels, from 92.7 to 90.9 per cent for production and from 95.3 to 90.5 per cent for shipments. In tonnage, production fell off 24,667 tons, while shipments declined 34,640 tons. Unfilled tonnage on hand May 1 was 577,969 tons compared with 619,823 tons April 1. Finished stock on hand awaiting shipment increased 8311 tons, while tonnage in stock unsold May 1 was 4614 tons less than on April 1. The comparative data compiled by the National Association of Sheet and Tin Plate Manufacturers follows:

Finished stock on hand awaiting	Net tons April	Per cent to capacity	Net tons March	Per cent to capacity
Sales	183,904	54.6	325,526	108.0
Production	254,808	90.9	279,475	92.7
Shipments	253,563	90.5	287,203	95.3
Unfilled tonnage first of month	577,969	206.2	619,823	205.6
shipment	115,574	41.2	107,263	35.5
In stock, unsold	24,470	8.7	29,084	9.6

The total number of hot mills in the United States is 668, having a capacity for April, 1923 of approximately 385,000 net tons. The percentage of the capacity to which the foregoing figures relate is 72.8 per cent.

April Auto Production Breaks Record

Washington, May 29.—Automobile production in April was at the annual rate of 4,580,940 cars and trucks, according to statistics compiled by the bureau of the census in co-operation with the National Automobile chamber of commerce and issued by the department of commerce today.

April production of passenger cars and trucks reached 381,745 establishing new monthly records for the output of both classifications.

Reports each month are with few exceptions from identical firms and include about 90 passenger car manufacturers and 80 truck manufacturers. Comparisons of production for the past ten months follows:

	Number of Machines			
	Passenger cars		Trucks	
	1922	1921	1922	1921
July	224,770	165,574	21,837	10,766
August	248,122	167,705	24,467	13,080
September	187,661	144,669	19,188	13,648
October	216,099	134,734	21,512	12,813
November	215,284	106,042	21,683	10,010
December	207,269	70,690	20,050	8,307
	1923	1922	1923	1922
January	233,706	81,693	*19,398	9,416
February	254,650	109,171	21,815	13,195
March	318,424	152,959	*34,603	19,761
April	344,379	197,216	37,366	22,342

*Revised.

Orders Booked

Ahead by Refractory Manufacturers—Labor Shortage Acute

Pittsburgh, May 29.—Conditions in the refractories industry continue practically to parallel those in the iron and steel trade. Practically all brick producers have good order books and shipments on these are heavy; demand for fire clay and silica brick on order being still keen. New buying, however, is somewhat dormant, although small lot orders for from 50,000 to 200,000 brick at a time are fairly numerous with a requirement of from 200,000 to 500,000 brick developing occasionally. New construction projects are not developing, however, to bring about the placing of orders for a million brick or more at a time, although occasionally larger brick producers receive orders for a spare blast furnace lining. Specifications on contracts are fairly heavy, sources of supply of the larger consumers like the Carnegie Steel Co., Bethlehem Steel Co., and others being kept fairly active in filling such orders on old contracts.

Prices are unchanged and while no specific weakness is encountered in the market, occasional departures from the accepted market levels of one dollar or so a thousand are encountered. Orders for magnesite brick continue to involve from a single carload up as requirements dictate and the same thing practically applies to chrome, although orders for 25,000 to 50,000 brick at a time are noted.

Kiln operations average between 70 and 80 per cent in this district, and brick makers would operate more heavily if they could obtain more workmen, the labor shortage being increasingly acute. The car supply is somewhat better than it was a month or six weeks ago.

Refractories

FIRE CLAY BRICK
(Per 1000 f.o.b. works)

Pennsylvania, No. 1	48.00 to 51.00
Pennsylvania, No. 2	43.00 to 46.00
Ohio, No. 1	45.00 to 47.00
Ohio, No. 2	40.00 to 43.00
Illinois, No. 1	48.00 to 50.00
Illinois, No. 2	45.00 to 47.00
Kentucky, No. 1	45.00 to 47.00
Kentucky, No. 2	40.00 to 42.00
Missouri, No. 1	48.00 to 50.00
Missouri, No. 2	38.00 to 42.00
Maryland, No. 1	50.00 to 53.00
Maryland, No. 2	44.00 to 45.00

SILICA BRICK

Pennsylvania	$46.00 to 47.00
Chicago	52.00 to 54.00
Birmingham	48.00

MAGNESITE BRICK
(Per Net Ton Seaboard Base)

9 x 4½ x 2½	$65.00

CHROME BRICK
(Per Net Ton)

9 x 4½ x 2½	$50.00

Complete 12-Hour Day Report Adopted

(*Continued from Page* 1595)

principle with the employers for many years last past. We think this will not be contradictel by fair-minded, unprejudiced, well-informed persons.

But in the consideration of this subject there are many questions of high importance, not invloving moral or social features. They are economic; they affect the pecuniary interests of the great public, which includes, but is not confined to, employers and employes. At the present time the United States and all other nations are especially interested in large production, whether it is on the farms, in the mines or in the manufactories. The largest reasonable production is necessary to bring about a restoration to stability, progress and prosperity; and large production at low cost, for sale at fair prices, the entire world is more dependent upon at the present time than ever before.

Our investigation shows that if the 12-hour day in the iron and steel industry should be abandoned at present, it would increase the cost of production on the average about 15 per cent, and there would be needed at least 60,000 additional employes. If labor were sufficiently plentiful to permit the change it would be necessary to add to the selling prices certainly as much as the increase in cost.

But it would be impossible under the existing conditions, to obtain a sufficient number of men to operate the plant on a three-shift basis up to a capacity which would supply the present necessities of the purchasing public. There are not now, under a two-shift practice at the furnaces, enough men to meet the demand for iron and steel.

To a material exent, the question of amount paid to employes, which is a very large proportion of the cost of producing, and which must necessarily determine the selling prices, is one between the employes and the purchasing public. Investors stand between these two, and it is their responsibility and their effort to decide fairly by both interests.

The responsibility for the numbers of employes is partly with the American congress because affected by immigration. There should not be permitted too much immigration, and certainly there should be none of dangerous or injurious quality; but there ought to be enough to keep our production of foodstuffs, of metals and of manufactures up to the necessities of the consuming publis; and sufficient to meet the demands of the national welfare, which embraces the export trade.

Therefore, under the present conditions, in view of the best interests of both employes and employers, and of the general public, the members of the committee cannot at this time report in favor of the total abolition of the 12-hour day.

There was a consistent, persistent and successful effort during the time labor was more plentiful to reduce the numbers of men employed 12 hours per days. Although the percentages fluctuated, depending upon circumstances, the percentage was gradually reduced, as stated publicly. If labor should become sufficient to permit it, the members of this committee would favor entirely abolishing the 12-hour day, provided the purchasing public would be satisfied with selling prices that justified it, and provided further that the employes would consent and that industry generally, including the farmers, would approve.

(Signed) E. H. Gary, Chairman
L. E. Block
J. A. Burden
J. A. Campbell
A. C. Dinkey
J. A. Farrell
E. G. Grace
W. L. King
J. A. Topping

Bauxite Output Larger

Washington, May 29.—A gain of over 100 per cent in 1922 in production of bauxite was registered in the comparison of the 309,000 long tons output of that year and the 139,550 long tons output in 1921. Imports fell off from 27,587 tons in 1922 to 22,219 tons in 1921 while exports jumped from 5942 tons in 1921 to 19,617 tons in 1922. Apparent consumption increased from 161,195 tons in 1921 to 312,202 tons in 1922. The Arkansas field produced 266,799 tons in 1922, or more than double its output in the previous year, but still less than half its maximum.

Implement Exports Larger

Washington, May 29.—March exports of agricultural implements from the United States were valued at $3,709,743, approximately $1,000,000 greater than February and in January and the highest since April, 1921, when exports amounted to $7,082,800, states the department of commerce. Greatly increased shipments of tractors have featured the exports in the first quarter of this year.

French Iron Production Gains in March

Paris, May 17.—On April 1, 77 furnaces were blowing in France; 96 were in working order and 46 in the course of construction or being repaired. A large proportion of the stacks blowing in the eastern district were being operated at much under normal capacity. The number of stacks blowing on April 1 was the same as on March 1, two having been blown out in Lorraine during March while one was blown in in the center and one in the southeastern district. However, 39 less stacks were blowing April 1 than on Jan. 1.

Pig iron production during March amounted to 316,146 tons, or 10,620 over February. Basic bessemer pig production amounted to 206,543 tons; foundry pig, 70,917 tons; refining pig, 28,445; acid bessemer pig, 1216 tons; special grades 9025 tons. Lorraine's contribution to the total tonnage was only 88,652 tons as against 101,356 during February, which shows how this region has suffered from the lack of coke.

The March output of steel ingots and castings amounted to 315,807 tons or 26,020 tons more than in February; ingots supplied 306,487 tons and steel castings 9320 tons. In Lorraine, the total steel production amounted to 79,222 tons only, as compared to 84,484 during February.

As a matter of fact, the average daily production of iron and steel in France was practically the same in March as in February. Pig iron production in March was 34.9 per cent below January figures, and 38.4 per cent below December figures. Respective percentages for steel are 22.6 and 23.9. The following table shows the comparison for the first three months of 1923:

	Pig iron	Ingots and castings
1913 monthly average.....	427,000	385,000
1922 monthly average.....	427,550	372,606
January, 1923	486,210	407,731
February	305,526	289,787
March	316,146	315,807

Spanish Industry Active

Activity has increased in the Spanish steel industry, according to a cable to the department of commerce from C. H. Cunningham, commercial attache at Madrid. Large orders for rails and other steel products for domestic use have been received. Lead production and exportation has remained active. The production of copper is depressed due to the Rio Tinto copper pyrite exportations. Iron ore exportation is improving, contracts having been made for 200,000 tons in March.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields

DR. OLIVER BOWLES, for nine years mineral technologist of the United States bureau of mines, has been named superintendent of the new mining experiment station of the bureau at Rutgers college, New Brunswick, N. J. Dr. Bowles is a graduate of the University of Toronto and has taught at the universities of Michigan and Minnesota. He will assume his new post July 1.

Harry R. Sinclair, president of the Worcester Stamped Metal Co., Worcester, Mass., will sail June 16 for a three months' European trip.

John E. Bradley, president of the Osgood Bradley Car Co., Worcester, Mass., is seriously ill at his home in that city.

Reginald Washburn, treasurer and general manager of the Washburn Co., Worcester, Mass., will sail June 27 to pass the summer in Europe.

Rowland A. Holmes has been placed in charge of the Detroit office of the Consolidated Machine Tool Corp. of America, New York, recently opened in the General Motors building.

Carlos Rittscher will leave shortly for South America, where he represents the Russell & Erwin Mfg. Co., division of the American Hardware Corp., New Britain, Conn.

H. Heddin, who for four years has been affiliated with the Pittsburgh office of the New Jersey Zinc Co., has been promoted to a sales position in the company's main office in New York.

Frank M. Ryan will sail June 30 for France, where he will be superintendent of the French plant of the Norton Co., Worcester, Mass., in La Courneuve, six miles north of Paris.

F. J. Miller has become connected with the National Grinding Wheel Co., Inc., Buffalo, in the capacity of sales engineer. He will represent the company in Ohio. Formerly he was connected with the Niagara Falls, N. Y., plant of the Norton Co., Worcester, Mass.

James H. Johnston, formerly secretary-treasurer of the Taylor-Wilson Mfg. Co., McKees Rocks, Pa., recently was elected president of the company to succeed H. M. Wilson, deceased. W. F. Taylor succeeded Mr. Johnston as secretary and treasurer.

B. M. W. Hanson, president of the Hanson-Whitney Machine Co., Hartford, Conn., was the principal speaker at the annual meeting and dinner of the New Britain branch of the Connecticut section of the American Society of Mechanical Engineers, May 24.

Joseph G. Worker, widely known combustion and stoker engineer, has joined the American Engineering Co., Philadelphia. Mr. Worker is secretary of the Stoker Manufacturers' association of the United States, and has spent many years in the study of coal burning by mechanical methods and processes. He is co-author of the book "Mechanical Stokers."

C. H. Coyle, vice president and director of purchases for the General American Tank Car Corp. and the General American Car Co., has resigned his position and has been succeeded by Lester N. Selig, assistant to the president, who will be acting director of purchases. R. M. McFarland has been appointed first assistant purchasing agent.

Dr. John Edward Stead of Middlesbrough at the recent May meeting of the Iron and Steel institute in London was absent through illness. He is seriously ill with a complication of diseases which disable him from active work. Dr. Stead is a past president and Bessemer medallist of the institute and has taken a distinguished part for many years in the progress of the metallurgy of iron and steel.

E. M. Thorpe, formerly affiliated with the Pittsburgh office of E. J. Lavino & Co., Philadelphia, in the sale of chrome, magnesite and silica brick, has been placed in charge of sales in the Pittsburgh district for the United States Refractories Co., with headquarters at 1447 Oliver building, Pittsburgh. He succeeds Park Hitchins who has been placed in charge of refractory sales in the Cleveland territory for the General Refractories Co.

Julian C. Smith, who has been appointed president of the Quebec Railway, Light, Heat & Power Co., Montreal, Que., has taken a prominent part in connection with hydroelectric power development. He is president of the newly formed St. Maurice Power Co., the Canadian Electric Products Co., the Public Service Corp., and the North Shore Power Co., as well as vice president and general manager of the Shawinigan Water & Power Co., and the Dominion Engineering Works, Ltd.

Everett L. Reed, who has been awarded £100 ($465) by the British Iron and Steel institute from the Andrew Carnegie research scholarship fund, is instructor in metallurgy at Harvard university, Boston. He graduated from Tufts college in 1916 and prior to his present appointment was successively assistant metallurgist at the Boston navy yard and metallurgist with Sauveur Boylston, Boston. The grant which he has recently received is to assist him in an investigation of the structure and physical properties of iron-carbon alloys melted and heat treated in vacuo.

Harry A. Hosmer, chief chemist for the Cambria Steel Co., Johnstown, Pa., since 1910, has resigned effective shortly after June 1 to establish a wholesale coal office in the new United States National Bank building, Franklin street, Johnstown. With him will be affiliated John Tredennick, of Boston. The company's name will be the Standish Coal Co. Mr. Hosmer will be succeeded by William E. Steiner, his former associate and who has been in the chemical department of the Cambria Steel Co., now the Cambria Steel Co. division of the Bethlehem Steel Co., for the past 15 years.

Frederick John Cook, Rudge-Littley Ltd., founders, Birmingham and West Bromwich, England, has been elected president of the Staffordshire Iron and Steel institute. He is well known in the United States, having represented the Institution of British Foundrymen at the annual meeting of the American Foundrymen's association held in Rochester, New York in the spring of 1922. Mr. Cook who was for two years president of the institution of British Foundrymen, also held the chairmanship for three years of the Midland Ironfounders' association, and for three years was secretary of the Malleable Ironfounders' association. After holding the position of foundry manager to Belliss & Morcom, engineers, of Birmingham, for 25 years, Mr. Cook left the company seven years ago to become the head of the Rudge-Littley firm.

Steel Exports Continue To Gain

April Tonnage Totals 183,905, an Increase of 15,729 Gross Tons Over March Shipments—Rail Exports in First Four Months of the Year Are Large—Ferromanganese Exports Increase During Month

WITH a total of 183,905 gross tons, exports of iron and steel in April made a gain of 15,729 tons as compared with those in March. However, compared with the corresponding month of 1922 the figures, which have just been made available by the United States department of commerce, bureau of foreign and domestic commerce, show a decline of 18,618 gross tons, as in April 1922, shipments of iron and steel abroad were 202,523 tons. The daily average of exports during April amounted to approximately 6130 tons which compares with a daily average of 5425 gross tons in March and 4887 tons in February.

April exports bring the total tonnage shipped abroad during the first four months of the year to 614,401 tons. This compares with 733,103 tons shipped abroad in the corresponding period of 1922. Rails continue to be exported in the heaviest volume, in the four months of the year 74,650 tons being shipped, which however, is below that of the tonnage exported in the same period of 1922, by 13,210 tons.

Compared with exports in the preceding month, shipments during April made a gain although it was not as large as that recorded in March as compared with February. Individual gains were registered for scrap with 4571 tons as against 4166 tons in the preceding month; steel bars with 15,413 against 14,175; wire rods with 3617 against 2650, boiler plate with 418 against 192; other plates with 13,609 compared with 11,700; galvanized sheets with 13,706 tons as against 12,373; black steel sheets with 10,502 against 8423; black iron sheets with 1510 against 755; cold-rolled strips with 1610 as against 1024; hoops, bands and scroll with 3008 as against 2071; tin and terne plate with 13,391 as compared with 7028; structural shapes fabricated with 5175 as compared with 1729; structural forms with 3211 compared with 2975; rails under 50 pounds with 15,172 compared with 1442; railroad spikes with 750 against 543, railroad bolts, nuts, etc., with 188 as against 169; casing and oil line pipe with 5505 against 3653; welded black pipe with 5852 as compared with 5757; malleable iron pipe fittings with 762 compared with 629; cast iron pipe fittings with 950 compared with 940; galvanized wire with 6790 against 4492; woven wire fencing with 478 against 217; wire rope and cable with 524 as compared with 488; cut nails with 621 compared with 300; wire nails with 3463 against 2051; bolts, nuts and rivets with 2127 compared with 1947; horseshoes with 40 tons compared with 26; ferromanganese and spiegeleisen with 1505 compared with 1000 and other iron and steel with 7506 gross tons compared with 5381.

Improvement was shown in exports of ferroalloys during April as compared with the preceding month. Exports of ferrosilicon during the period totaled 38 tons. This is the only item in the ferroalloy classification which shows a decline compared with the preceding month. Shipments of ferrosilicon in March totaled 242 tons. During April 1505 gross tons of ferromanganese and spiegeleisen were exported which compares with 1000 tons in the preceding month. Total exports of ferromanganese and spiegeleisen during the four months ending April are 2557 tons which compares with 633 tons in 1922.

Figures issued by the bureau of foreign and domestic commerce place the valuation of iron and steel exports during April at $20,146,346. This compares with $17,981,180 in March and $17,549,618 in April one year ago.

IMPORTS AND EXPORTS
Gross Tons

	1923		1922	
	Imports	Exports	Imports	Exports
Jan.	119,955	135,046	13,404	165,962
Feb.	67,682	136,853	11,535	133,333
March	.....	168,176	12,774	206,474
April	.....	183,905	18,720	197,562
May	.....	.....	23,098	229,616
June	.....	.....	39,154	216,298
July	.....	.....	62,426	157,027
Aug.	.....	.....	49,054	144,264
Sept.	.....	.....	76,393	128,370
Oct.	.....	.....	184,202	131,542
Nov.	.....	.....	152,250	124,004
Dec.	.....	.....	96,358	154,087
Total	187,637	623,980	739,368	1,988,539

Year	Imports	Exports
1921	135,825	2,150,276
1920	421,274	4,934,087
1919	322,264	4,397,295
1918	169,110	5,338,019
1917	330,201	6,465,053
1916	328,965	6,110,732
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635

IRON AND STEEL EXPORTS
Gross Tons

	April		Four months ending April	
	1923	1922	1923	1922
Pig iron	1,844	2,750	1,037	6,515
Scrap	4,571	10,596	13,047	43,316
*Semifinished steel	11,247	9,374	40,957	41,189
Steel bars	15,413	27,816	55,207	62,973
Iron bars	838		6,879	
Alloy steel bars	97		426	
Wire rods	3,617	6,980	9,587	24,358
Boiler plate	418	2,559	3,321	6,714
Other plates	13,609	10,525	40,942	25,088
Galvanized sheets	13,706	8,748	44,067	43,951
Black sheets steel	10,502	29,171	33,802	111,099
Black sheets, iron	1,510	794	3,966	5,335
Cold - rolled strips	1,610	173	4,314	1,493
Hoops, bands and scroll	3,008	2,633	9,309	9,828
Tin and terne plate	13,391	4,663	31,921	30,763
Structurel shapes, plain	10,131	5,485	42,213	12,545
Structural shapes, fabricated	5,175	1,533	10,144	8,288
Ship and tank plates, punched and shaped	89	58	735	944
Other structural forms	3,211	5,535	12,156	18,178
Metal lath	92	**	260	**
Rails over 50 pounds	15,172	15,502	66,444	78,867
Rails under 50 pounds	2,385	2,389	8,206	8,593
Rails, joints, etc.	1,353	2,255	5,084	5,390
Switches, frogs, etc.	286	471	1,684	1,907
Railroad spikes	750	676	2,413	2,154
Railroad bolts, nuts, etc.	188	162	746	661
Boiler tubes	1,045	791	4,911	3,254
Casing and oil line pipe	5,505	3,648	17,230	14,507
Welded black pipe	5,852	6,499	21,722	28,832
Welded galvanized pipe	1,896	2,948	8,557	8,724
Malleable iron pipe fittings	762	767	2,286	2,624
Cast iron pipe	861	1,369	4,705	5,908
Cast iron pipe fittings	950	992	3,662	2,730
Plain wire	1,953	3,318	9,095	1,210
Galvanized wire	6,390	9,094	16,312	32,763
Barbed wire	6,293	5,531	22,618	14,576
Woven wire fencing	478	135	1,243	747
Wire cloth and screening	78	97	441	311
Wire rope and cable	524	273	2,110	1,307
Insulated wire and cable	156	55	648	382
Other wire	1,059	1,837	4,606	5,523
Cut nails	621	234	1,240	1,339
Horseshoe nails	107	69	414	280
Wire nails	3,463	6,775	9,777	28,807
Other nails	483	437	1,632	1,371
†Bolts, nuts, rivets, etc.	2,127	1,980	6,705	6,203
Horseshoes	40	49	233	182
Other iron and steel	7,506	4,536	22,478	20,587
Ferromanganese and spiegeleisen	1,505	241	2,557	638
Ferrosilicon	38	....	352	149
Total	183,905	202,523	614,401	733,103

*Includes ingots, blooms, billets, slabs and skelp.
**Due to reclassifications comparisons are not possible.
†Includes wood screws.

CASTINGS AND FORGINGS

	April		Four months ending April	
	1923	1922	1923	1922
Iron castings	752	1,091	3,593	3,533
Steel castings	431	109	861	794
Car wheels and axles	1,170	1,279	4,982	5,808
Iron and steel forgings	495	391	1,161	844
Total	2,848	2,870	10,597	10,979

FERROALLOY EXPORTS
Gross tons

	April		Four months ending April	
	1923	1922	1923	1922
Ferrosilicon	38	....	352	149
Ferromanganese and spiegeleisen	1,505	241	2,557	633
Tungsten, manganese and other alloys	121	....	240	.....
Ferrotungsten, tungsten metal and wire	498	....	841	14
Ferrovanadium	2	4	9	15
Other ferroalloys	50	91	377	471

Wages at Furnaces Compared

Average Hourly Earnings for Principal Occupations in Manufacture of Pig Iron in 1922 Shows Increase of 91 Per Cent Over 1913, Decrease of 33 Per Cent from 1920—Common Labor Pay Reported as 31.6 Cents

AVERAGE earnings per hour at blast furnaces in the United States in 1922 as compared with 1920 show a decrease of 33 per cent; as compared with 1913 an increase of 91 per cent, and as compared with 1910 an increase of 120 per cent. Relatively, the changes in average fulltime weekly earnings approximate those of hourly earnings, according to the bureau of labor statistics, department of labor, which has just issued the results of its latest tabulations.

Average customar, fulltime hours in 1922 show no change from 1920, and a decrease of 9 per cent from 1910. The figures for 1922 were collected in the fall of the year, mostly in October, and cover 32 representative plants; those for the earlier years are drawn from preceding reports of the government bureau.

Index numbers for customary full-time hours, hourly earnings and full-time weekly earnings for the selected occupations combined, are shown in the following table for the years from 1907 to 1922, except 1916, 1918 and 1921 for which figures are not available. The index numbers are based on the figures for 1913 which are used to represent 100:

	Customary fulltime hours per week	Earnings per hour	Fulltime weekly earnings
1907	103	83	91
1908	101	85	86
1909	102	83	85
1910	102	87	90
1911	102	89	90
1912	99	92	90
1913	100	100	100
1914	97	101	97
1915	97	101	97
1917	98	156	152
1919	100	250	248
1920	93	283	258
1922	93	191	176

While the increase in hourly earnings in 1922 over 1913 is 91 per cent for the combined occupations as a whole, the bureau points out that there is more or less variation in the figures for the several occupations taken separately. In the accompanying table are shown the most significant facts concerning average hours and average earnings for the principal productive occupations at blast furnaces in the period from 1910 to 1922, so far as available. Earnings of blowers show an increase of 104 per cent in 1922 over 1913, while those of iron handlers and loaders show only 40 per cent increase for the same period. Laborers' rates were 85 per cent higher than in 1913, but 33 per cent below those of 1920. The average fulltime hourly rate for laborers in 1922 reported by the bureau was 31.6 cents, and the average fulltime weekly earnings $21.75. Wages for all the occupations have been increased since the bureau's figures were compiled, the common labor rate of the United States Steel Corp. having been raised from 36 cents to 40 cents an hour.

Victory for American Plan in San Francisco

San Francisco, May 29.—"The acquittal of the 34 building material dealers who had been prosecuted by two special attorneys employed by union labor in the courts of San Francisco for declining to sell material to contractors who would not support the American plan, was more than a militant, local victory," says a recent statement of the Industrial Association of San Francisco. "It was a victory so complete, and so nationwide in its scope, that it should rebound to the benefit of every community that seeks to free its industry from autocratic control."

Blast-Furnace Wage Changes Given by Occupations

First column, under each occupation, gives average fulltime hours per week; second column average earnings per hour, and third column average fulltime weekly earnings.

	Stockers			Larrymen			Blowers			Stove tenders			Pig-machine men		
1910	79.9	$0.164	$13.17	84.0	$0.196	$16.47	83.5	$0.296	$24.74	84.0	$0.193	$16.21	83.9	$0.169	$14.14
1911	79.7	0.168	13.40	82.9	0.194	15.99	82.9	0.305	25.21	82.7	0.190	15.68	82.4	0.169	13.98
1912	78.8	0.171	13.46	78.2	0.199	15.46	80.3	0.315	25.01	79.5	0.195	15.38	81.9	0.171	13.97
1913	78.0	0.192	15.00	82.3	0.217	17.77	82.2	0.332	27.21	81.9	0.211	17.30	81.9	0.192	15.72
1914	74.9	0.188	14.03	78.6	0.215	16.88	80.7	0.333	26.74	79.9	0.209	16.56	79.2	0.192	15.15
1915	74.6	0.188	13.99	78.6	0.211	16.51	80.6	0.336	26.93	79.4	0.208	16.46	79.6	0.190	15.07
1917	77.4	0.295	22.79	77.2	0.327	25.14	77.8	0.485	37.50	...	....	....	77.9	0.300	23.21
1919	78.1	0.465	36.32	80.4	0.542	43.58	79.8	0.755	60.25	80.3	0.528	42.40	80.5	0.477	38.40
1920	75.5	0.527	39.68	73.8	0.586	42.65	73.2	0.868	62.87	73.7	0.592	43.38	72.2	0.552	39.63
1922	74.4	0.352	26.06	75.1	0.402	29.96	72.4	0.678	49.00	75.2	0.403	30.08	73.1	0.380	27.73

	Bottom fillers			Larrymen's helpers			Blowing engineers			Keepers			Cinder men		
1910	84.0	0.152	12.77	84.0	0.165	13.88	84.0	0.243	20.39	84.0	0.215	18.09	82.9	0.163	13.56
1911	84.0	0.149	12.50	82.6	0.168	13.89	82.9	0.244	20.15	82.7	0.217	17.95	81.3	0.158	12.84
1912	82.2	0.152	12.53	79.6	0.172	13.64	80.6	0.249	19.93	79.6	0.223	17.59	75.2	0.164	12.20
1913	82.1	0.168	13.88	82.6	0.191	15.78	82.0	0.260	21.28	82.0	0.235	19.28	79.9	0.179	14.27
1914	82.0	0.167	13.76	78.6	0.187	14.67	79.3	0.262	20.64	79.6	0.233	18.47	78.3	0.176	13.78
1915	82.4	0.176	14.48	78.3	0.185	14.43	79.1	0.262	20.64	79.4	0.232	18.33	78.6	0.174	13.64
1917	84.0	0.270	22.68	79.6	0.292	23.20	76.1	0.391	29.61	77.4	0.344	26.53	78.4	0.286	22.31
1919	82.2	0.436	35.84	79.3	0.491	38.94	80.0	0.628	50.24	80.6	0.562	45.30	77.2	0.473	36.52
1920	67.1	0.568	38.35	73.9	0.531	39.09	73.7	0.720	52.50	73.7	0.635	46.45	68.4	0.557	37.85
1922	72.8	0.336	24.44	74.9	0.356	26.40	74.2	0.483	35.49	75.3	0.420	31.47	72.1	0.390	27.91

	Top fillers			Skip operators			Blowing engineers' assistants			Iron handlers and loaders			Laborers		
1910	82.8	0.169	13.25	84.0	0.197	16.56	84.0	0.207	17.38	74.2	0.194	14.36	74.7	0.150	11.23
1911	82.2	0.171	13.84	83.8	0.198	16.60	83.2	0.205	17.06	73.0	0.195	14.17	73.3	0.151	11.14
1912	80.0	0.175	13.81	79.3	0.206	16.19	80.4	0.211	16.85	73.1	0.206	15.11	73.1	0.152	11.15
1913	80.3	0.191	15.19	82.9	0.217	17.97	83.2	0.225	18.67	72.5	0.220	16.07	72.5	0.171	12.43
1914	80.1	0.199	15.71	79.5	0.214	16.98	79.0	0.223	17.57	71.5	0.222	16.09	70.8	0.177	12.52
1915	79.0	0.213	16.44	79.4	0.215	17.03	78.3	0.223	17.41	74.0	0.204	15.22	71.3	0.171	12.20
1917	84.0	0.257	21.57	77.3	0.343	26.52	...	....	....	71.4	0.243	17.44	75.3	0.281	21.33
1919	76.7	0.468	35.90	80.4	0.536	43.09	79.1	0.565	44.69	72.9	0.361	26.32	77.9	0.457	35.60
1920	71.2	0.573	39.72	73.4	0.594	43.30	71.7	0.632	45.24	72.2	0.443	32.00	72.3	0.474	34.60
1922	68.8	0.388	26.02	75.8	0.401	30.20	73.5	0.424	31.08	70.4	0.307	21.67	67.7	0.316	21.75

Current Iron and Steel Prices of Europe

Last Reported Prices Converted into Dollars at Rates of Exchange, May 28

British Market

Home Market Prices. Gross Tons at Works or Furnace

Corrected to Date by Cable

	$	£ s d
SEMIFINISHED STEEL		
Billets, soft steel	37.04	8 0 0
Sheet bars	37.04	8 0 0
Wire rods	57.88	12 10 0
FINISHED STEEL		
Steel bars, England, ⅜ to 3-inch	48.62	10 10 0
Steel bars, England, ⅜ to 3-inch, for export	46.30	10 0 0
Plates, ship, bridge and tank, England	42.83	9 5 0
Plates, ship, bridge and tank, Scotland	42.83	9 5 0
Beams, England	43.99	9 10 0
Beams, Scotland	43.99	9 10 0
Sheets, black, 24 gage	60.19	13 0 0
Sheets, galvanized, 24 gage	89.13	19 5 0
Rails, 60 lbs. and over	46.30	10 0 0
Rails, 60 lbs. and over, for export	45.14	9 15 0
Tin plate, base box, 108 lbs	5.32	1 3 0
Steel hoops	55.56	12 0 0
Steel hoops, for export	54.40	11 15 0
PIG IRON		
Hematite, East Coast, Mixed Numbers	28.36	6 2 6
Hematite, West Coast, Mixed Numbers	28.36	6 2 6
Basic Middlesbrough	28.36	6 2 6
No. 3 Foundry, Middlesbrough	28.24	6 2 0
No. 3 Foundry, Derby, Leicester, Nottingham	25.47	5 10 0
No. 3 Foundry, Staffordshire	24.89	5 7 6
No. 3 Foundry, Northamptonshire	24.89	5 7 6
No. 3 Foundry, Scotch	26.62	5 15 0
Ferromanganese, 76 to 80 per cent	83.34	18 0 0
Ferromanganese, 76 to 80 per cent, for export	92.60	20 0 0
COKE		
Yorkshire furnace	6.95	1 10 0
Yorkshire furnace, for export	15.05	3 5 0
Yorkshire foundry	6.95	1 10 0
Yorkshire foundry, for export	15.05	3 5 0

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported

PIG IRON

	$	Marks per metric ton
Hematite, Oberhausen	12.55	678,300
Foundry, No. 3, Oberhausen	11.94	645,300
Bessemer Stahleisen, Siegen	13.62	736,300
Foundry, No. 1, Oberhausen	11.99	648,300
Luxemburg Foundry	11.75	635,300
COKE		
Ruhr furnace	1.96	105,740
Ruhr foundry	2.02	108,950
SEMIFINISHED STEEL		
Billets	16.63	899,000
Sheet bars	20.33	1,099,000
Wire rods	19.74	1,067,000
FINISHED STEEL		
Standard rails	23.20	1,254,000
Merchant bars	23.13	1,250,000
Structural shapes	22.92	1,239,000
Ship plates	26.07	1,409,000
Medium plates, 3 to 5 millimeters	29.29	1,583,000
Sheets, below 3 millimeters	33.61	1,817,000
Tin plate	nominal	nominal
Plain wire	24.68	1,334,000
Bands and strips	27.92	1,509,000
Sheets, below 1 millimeter	34.36	1,971,000

All prices are f.o.b. furnace or mill.

French Market

Prices Last Reported

PIG IRON

	$	Francs per metric ton (2205 lbs.)
Hematite, Lorraine	33.74	510
Basic bessemer, Lorraine	31.09	740
Foundry, Longwy, No. 3, sand-cast	30.43	460
Foundry, Longwy, No. 3, chill-cast	31.09	470
Ferromanganese, 76 to 80 per cent	102.53	1,550
COKE		
French furnace	8.93	135
German furnace, f.o.b. frontier*	13.10	198
German furnace, f.o.b. frontier**	20.51	310
French foundry	9.59	145
SEMIFINISHED STEEL		
Blooms	39.36	595
Billets	42.01	635
Sheet bars	45.97	695
FINISHED STEEL		
Standard rails	36.38	550
Merchant bars	47.30	715
Angles	45.31	685
Normal beams and profiles	45.31	685
Plates, ship and tank, 10 millimeters and thicker	52.26	790
Plates, bridge and tank, 5 to 10 millimeters	53.58	810
Sheets, black, 3 millimeters	56.23	850
Sheets, blue annealed, 2 millimeters	64.17	970
Shafting, cold-drawn, 40 to 60 millimeters	92.61	1,400
Bars, 2 per cent nickel steel	145.53	2,200

All prices are f.o.b. furnace or works.
*Up to 38 per cent of normal requirements.
**Over 38 per cent of normal requirements.

Belgian Market

Prices Last Reported

PIG IRON

	$	Francs per metric ton (2205 lbs.)
Basic bessemer, Belgian	22.78	400
Basic open-hearth, Belgian	31.04	545
Gray forge, Belgian	15.38	270
Foundry, No. 3, Belgian	27.91	490
Foundry, No. 3, Luxemburg	27.91	490
Foundry, No. 3, Lorraine	27.91	490
SEMIFINISHED STEEL		
Blooms	30.47	535
Billets	34.17	600
Sheet bars	35.59	625
Wire rods	46.98	825
FINISHED MATERIAL		
Standard rails	41.29	725
Merchant bars	37.59	660
Normal beams and profiles	36.45	640
Plates, 5 millimeters and thicker	39.87	700
Sheets, black, 3 millimeters	42.71	750
Sheets, galvanized, 1 millimeter	106.78	1,875
Plain wire	71.19	1,250
Galvanized wire	82.57	1,450
Wire nails	71.19	1,250

All prices are f.o.b. furnace or works.

Review British Market

(*Concluded from Page* 1591)

There is some little concern over a renewed attempt on the part of Norway to make tin plates. The effort was a failure last year but it is understood that the new attempt will have the assistance of the government. The British exports to Norway during the three months ended March amounted to 6242 tons, and the Norwegian business is regarded in South Wales as valuable.

Galvanized sheets still are on the basis of £19 10s ($90.09) and the makers are well situated with orders. This trade like that of tin plate has benefited through the fall in nonferrous materials, spelter being decidedly easier.

Steel scrap is very weak. Prices have declined about £1 5s ($5.77) since five weeks ago. There has been a procession of continental vessels discharging steel scrap at Newport and neighboring Welsh ports at prices much lower than any obtainable locally.

Over Half of Ruhr Coke Ovens Now Cold

European Special Service

DUSSELDORF, Germany, May 17. —More than half the coke ovens in the occupied territory have been allowed to get cold. This step was taken to embarrass the French authorities in their policy of seizing fuel supplies. When the stocks of coke which are now being taken away are removed the production will not be sufficient for the combined Franco-Belgian and Ruhr requirements. The men who have been thrown out of normal employment in the coal mines and around the coke ovens are employed on repair jobs and development work.

Mark—$0.000025

In the occupied territory business remains at a low ebb. While there still is considerable business in unoccupied Germany, trade is less active than it was a short time ago. Heavy imports of

foreign coal, pig iron and steel products are being received on old contracts but no new orders are being placed. Export business is quiet. The coal miners in the Ruhr district are asking for an increase in wages of 40 per cent on account of the recent depreciation of the mark. It is not believed at present that they will be granted more than 10 per cent because the government is exceedingly anxious to avoid further increase in coal prices.

Transactions in iron ore are at a low ebb, with one exception. There is a heavy demand for manganiferous and manganese ores in unoccupied territory. Indian ores are 1 shilling 10 pence ($0.60) per unit c.i.f. Hamburg and Bremen.

Yielding to the representations of the Ruhr steelmakers who are anxious to resume export trading, the German government has finally agreed to withdraw its opposition to the French export licensing system to the extent of permitting licenses to be applied for covering orders entered prior to Feb. 20. This is on condition that the German seller has no dealing with the allied authorities, the application for export license and other negotiations being conducted entirely by the foreign purchaser who must also agree to pay the French export duty which now ranges from 4 to 10 per cent ad valorum. This represents a considerable concession and is an indication of the fact that German resistance to the occupation is becoming less effective. There is now talk of an armistice, that is, of the Germans giving up their program of passive resistance while negotiations with the French take place but with the reservation that in case the negotiations fail the resistance will be renewed. Semifinished and finished steel prices have been advanced. The increases average 23½ per cent but represent very little change on the gold basis. The new quotation for billets is 899,000 marks a metric ton, with shapes, bars, and plates 1,239,000 marks to 1,409,000 marks a ton, equivalent to 1.30c to 1.50c a pound. These quotations show that prices expressed in marks must be further increased in order to bring them up to the world levels. The current quotations are largely nominal owing to the extremely limited volume of business being done.

Germans Seeking Steel Orders in Japan

Foreign Special Service

TOKIO, Japan, May 16.—A feeling of uncertainty prevails in the iron and steel trade of Japan. Prices continue to weaken as the volume of business narrows. Supplies of material are increasing, causing anxiety. Chinese blast furnaces have started to dump iron, following similar action by Indian furnaces.

Toward the close of April a sign of improvement was apparent in the iron and steel market. Prices showed more strength. There was a decline in arrivals of steel from abroad, and the activity of Indian furnaces was curtailed somewhat by an increase in freight rates from India to Japan. Material has not been absorbed as expected and the Hanyang furnaces (Chinese) have unloaded 10,000 tons at low prices in the past week. In the steel market agents for German makers have resumed their selling efforts, apparently in anticipation of a settlement of the Ruhr controversy, although it is doubted if they can deliver if contracts are secured. The stock of pig iron at the close of April amounted to 146,212 tons of which 72,058 tons was in the hands of furnaces. On April 15 the stock was slightly less than 140,000 tons. Records of steel stocks are not authentic, but the supply is increasing, the government steel works having more than 80,000 tons on hand.

Yen—$0.49

In the pig iron market melters still are covering their requirements though tonnages have been greatly reduced. No. 1 Japanese pig iron is quoted at 70 yen ($34.30) per ton and No. 2 and No. 3 at 65 and 60 yen ($31.85 and $29.40). No. 1 Hanyang is quoted at 66 yen ($32.34). Cleveland (British) is 85 yen ($41.65). Steel bars are quoted at 5 yen ($2.45) per 10 kwamme. Plates are 4.80 yen ($2.35), sheets 8.30 yen ($4.07). Ten kwamme equal 82.67 pounds. Black sheets and wire which have been comparatively firm are being reduced.

Bulgaria Places Order for 6000 Plows

European Special Service

Austrian Crown—$0.000014

VIENNA, Austria, May 16.—Bars are being sold in Austria at about £12 per ton, equivalent to 2.50c a pound. A considerable tonnage is going forward to Germany but few new orders are being received from that country. The Alpine Montan Gesellschaft, the largest Austrian producer, has one small and three large blast furnaces in operation.

In Czecho-Slovakia business is quieter. Coal exports to Germany are less but the demand for coke is being maintained. Czech iron and steel exports in the first quarter of this year were valued at 143,000,000 crowns ($4,161,000); machinery exports were valued at 28,000,000 crowns ($815,000). About 40 per cent of the exports were to Germany and Austria. The Witkowitz company has obtained an order for an ore-dressing plant to be built in Bulgaria at a cost of 4,000,000 crowns ($116,000). Bulgarian interests have placed an order for 6000 plows with the Baecher agricultural implement factory in Czecho-Slovakia.

Czech Crown—$0.0291

Reports from Poland indicate that Hugo Stinnes is negotiating for the purchase of coal mines and blast furnaces belonging to the Bismarkhutte and the Kattowitz company in Polish Upper Silesia, the objective being a central European combination into which the Schneider interests who control the Skoda works might enter.

Belgians Struggle Against Coke Famine

European Staff Special

BRUSSELS, May 3.—The situation of the Belgian iron and steel market remains unchanged. The fuel shortage is acute and the inability of blast furnace operators to obtain ample supplies of coke is having a disastrous effect on the metallurgical industry. Receipts of coke from the Ruhr are insignificant. During the last four months coke has increased in price from 95 francs ($5.70) to 215 francs ($12.90). Coke now being received is of inferior quality and the cinder content frequently reaches as high as 20 per cent.

Franc—$0.006

Stocks of pig iron have been completely liquidated and producers show no inclination to take on new business in view of the uncertain outlook. Domestic demand for semifinished steel products is brisk and prices are firm. The Belgian mills will have no difficulty in maintaining their strong position so long as Luxemburg and Lorrane mills remain inactive. The export market, however, is quiet as Belgian prices are no longer attractive to English buyers.

The market for finished steel products is irregular. Offers made at the Metal Bourse show a wide range in prices. Two large mills quoted 760 francs ($45.60) on a specification calling for several hundred tons of merchant bars, a third concern offered to take the tonnage at 750 francs ($45) but the lot was finally placed at 725 francs ($43.50). The plate mills in the Charleroi district are seeking tonnage.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

ADVICES have been received from the Smith Gas Engineering Co., Dayton, O., to the effect it recently installed a producer plant to furnish clean gas for heating rolls in the plant of the Newton Steel Co., Newton Falls, O. This is the second installation of this type made in the plant in the last couple of years. The company also recently received an order from the Ford Motor Co., Detroit, for three 16-foot mechanically operated producers for that company's Highland Park plant. Three producers ordered by the Ford company several months ago now are being installed and one of them is already in service. When the present plant is completed 11 large producers will be in service, in addition to several hand-operated machines. The daily capacity of this plant will then be 75,000,000 cubic feet of clean producer gas. A small producer plant recently was installed by the Smith company in the plant of Altorfer Bros., Peoria, Ill., the gas from which is used for heat treating, forging and similar operations.

* * *

A M. JONES of the A. M. Jones & Co., has purchased the plant of the West Allis Foundry Co., West Allis, Milwaukee. He will continue the manufacture of gray iron and semi-steel castings and the organization operating the foundry will continue unchanged.

* * *

ADVICES have been received from Collins Motor Products, Ltd., Belleville, Ont., to the effect it has established an automobile body business for the purpose of building commercial auto bodies for the Canadian trade. The company's plans call for the erection of two units, 80 x 183 feet, one-story. Construction of these buildings will be followed by the erection of several other structures, including a machine shop and custom warehouse combined.

* * *

AT THE annual meeting of E. & T. Fairbanks Co., St. Johnsburg, Vt., the following directors were elected: Henry J. Fuller, New York; C. H. Morse, Chicago; R. H. Morse, Chicago; W. E. Miller, Chicago; P. C. Brooks, New York; A. E. Ashcraft, St. Johnsbury; and J. C. Clark, St. Johnsbury. At the annual meeting of the Moline Scale Co. the same officers were elected for that corporation.

* * *

THE Standard Sanitary Mfg. Co., Pittsburgh, with plants at Louisville and other centers, has purchased property at Birmingham, Ala., where it plans to establish a warehouse and show room. The company manufactures bath tubs, plumbing equipment, etc., and purchases considerable pig iron in the Birmingham district for its Louisville plant.

* * *

PURCHASE of all necessary equipment for the proposed extension to its plant has been made by the West Virginia Rail Co., Huntington, W. Va., and the company therefore is not in the market for machinery or equipment of any kind at this time. H. A. Zeller is general manager of the company.

* * *

THE Townsend Mfg. Co., Janesville, Wis., maker of kerosene engines, tractors, etc., which has been in bankruptcy for the past year, will be reorganized by Roy Townsend, who was the successful bidder for the machinery and equipment at trustee's sale. This means the plant will be kept intact. Mr. Townsend plans to resume work in the plant on a small scale about June 1.

* * *

STEPS are to be taken looking toward the reorganization of the Holmes Automobile Co., Canton, O., following the sale recently of the property to the bondholders of the company. Announcement has been made to the effect the company has been taken over by the holders of the outstanding bonds. The company manufactures air-cooled motored automobiles.

* * *

INCORPORATION papers have been filed in Illinois and a branch office and warehouse opened in Chicago by the National Cast Iron Pipe Co., Birmingham, Ala. The articles of incorporation placed the capitalization at $1,000,000, of which $161,000 represents the capital for the Illinois branch of the business. A. E. Nelson is in charge of the new office and warehouse.

* * *

THE Central Mfg. District, Inc., of Los Angeles, has retained Frank D. Chase, Inc., Chicago, architect and engineer, to erect a warehouse and manufacturing terminal which will be the largest of its kind on the Pacific coast, at a cost of $5,000,000. This building will be the nucleus of a development similar to the Central Mfg. District, which has been developed in Chicago in the past few years. The enterprise is backed by Chicago, New York and Boston business men.

* * *

A CENTRAL heating plant with three 500-horsepower boilers is embraced by plans adopted by the Washington Building Corp. at Madison, Wis., for a four-story commercial structure at East Main and Webster streets. There will be a large public auditorium on the upper floors and the central station in the basement. The total cost will be about $200,000, including an estimate of $50,000 on boilers. C. C. Doring is president of the company.

* * *

ADVICES have been received from the Northern Wisconsin Hydro-Electric Power Co., Inc., Port Wing, Wis., to the effect power equipment for the company's new dam under construction at Orienta Falls on the Iron river, seven miles west of Port Wing, has been purchased. The initial installation is 5000 horsepower and a development of 40-foot head. A 33,000-volt transmission line now is under construction between Orienta Falls and Port Wing and the necessary material has been purchased. An extension is being planned from Port Wing to Bayfield, Wis., to supply the municipal plant at that city with power. The distance is approximately 30 miles, and the transmission line will be of pole construction, 33,000 volts. Other extensions are under consideration to Iron River, Brule, Lake Nabagemon, Herbster and Corncuopia.

Canadian Output

Shows Gain For Iron and Steel—Power Plants Planned

Toronto, Ont., May 28.—A report issued by the dominion bureau of statistics states that the production of steel ingots and castings in Canada during April amounted to 92,598 tons, an increase of 3510 tons over the output for March. The output for April, 1922 was 21,925 tons. Production in the first four months of 1923 was 276,184 tons, compared with 176,036 tons for the corresponding period last year and 127,275 tons in the same period of 1921.

The pig iron output of 83,877 tons in April was in advance of all monthly records since November, 1920, when the production was 93,525. The March, 1923 output was 65,297 tons. Production of pig iron in the first four months of 1923 amounted to 234,163 tons, as compared with 140,061 tons during the corresponding period of 1922.

A merger is in prospect between the Dominion Radiator Co., Ltd., of Toronto, and the American Radiator Co. of Canada, the plant of which is in Brantford. It is understood that the American company proposes to purchase the plant and assets of the Dominion company at approximately $2,000,000.

The Newfoundland Power & Paper Co., Ltd., has been formed to build and operate pulp and paper mills and power plants in Newfoundland. A 400-ton pulp and paper mill will be erected. Backers of the plan include the W. G. Armstrong-Whitworth Co., of Newcastle-on-Tyne, England, whose Canadian interests were recently taken over by the Charles Walmsley Co., Ltd., now operating at Longueuil, Que. The project will involve an expenditure of $25,000,000.

Tin Plate Wages Raised by New Agreement

Atlantic City, N. J., May 29.—Representatives of the Western Sheet & Tin Plate Manufacturers association in conference with a committee of the Amalgamated Association of Iron, Steel and Tin Workers in this city last week agreed on a renewal of their working relations for the year beginning July 1. The scale for the sheet mill workers will be the same as for the past year. It was agreed that the tin mill wages will be governed by the same percentages that apply in determining sheet mill wages. This will give the tin mill workers an advance of 11 per cent, and the tin house workers an advance of about 10 per cent. Working conditions are to remain the same as at present. The date for the bar iron manufacturers' conference with the Amalgamated association's committee has not been set.

Will Aid War Veterans

E. H. Gary, chairman of the United States Steel Corp., and the president of the subsidiary companies have assured General Frank T. Hines, director of the United States Veteran's bureau, that they will assist wherever possible in aiding the bureau in its work of obtaining employment for men disabled in the war. General Hines states that there are approximately 30,000 of such men in the country, who are in need of opportunities with large industrial concerns.

Wickwire Sales Large

April earnings of the Wickwire Spencer Steel Corp., including the American Wire Fabrics Corp. are at $114,675, after all charges. The company's mills are said to be running at capacity with a large volume of business booked, sufficient, it is estimated, to guarantee operations at a good rate for the remainder of 1923.

Obituaries

PROF. Dr. Hans Goldschmidt, inventor of the thermit process for welding iron and steel and for producing high grade metals and alloys, also originator of many other inventions, died suddenly in Baden-Baden, Germany, May 20. He was born in Berlin, Jan. 18, 1861. His father was the proprietor of chemical works and tin smelter which he founded in 1847. After graduating from the "gymnasium" of Altenburg, Dr. Goldschmidt studied chemistry, physics and natural sciences in general at the universities of Berlin, Leipzig, Heidelberg, Strassburg and the Institute of Technology at Charlottenburg. In 1887 he entered the firm of Th. Goldschmidt, Essen Ruhr, Germany, in partnership with his brother Dr. Karl Goldschmidt. The attention of the latter was applied mainly to the business management of the company, while Prof. Goldschmidt devoted himself to scientific research. His most important invention was the thermit process, now used extensively for welding iron and steel sections, and for producing metals and alloys of high purity. Prof. Goldschmidt visited this country frequently and was president of the Goldschmidt Thermit Co., now Metal & Thermit Corp., from 1904 to 1916.

Harry P. Mahaffey, aged 45, assistant superintendent of the Wilmore Coal Co., Windber, Pa., died May 23.

James W. Donnell, formerly president of the Donnell Safe Co., Chicago, for 38 years, died May 23. He was 74 years old.

L. O. Koven, senior partner in the firm of L. O. Koven & Bro., Jersey City, N. J., and vice president and treasurer of the Hoevel Mfg. Corp. died May 17. He was 63 years old.

Charles Pettigrew, for many years general superintendent of the Joliet works of the Illinois Steel Co., died May 22 at his winter home at Pasadena, Cal., aged 79 years.

Ernest Frederick Greene, for many years cashier of the Providence, R. I. branch of the Crompton & Knowles Loom Works, Worcester, Mass., died at his home in Barrington, R. I., May 19, aged 68 years.

Elisha H. Talbot, founder of the *Railway Age*, died April 22 at his home in New York City, aged 83. Mr. Talbot was born in Ohio and was in other publishing ventures but retired some years ago.

John H. Brett Sr., pioneer in engineering machinery for the manufacture of ice, died suddenly at his home in Cleveland, May 21. He was 74 years old, and for many years was connected with the Arctic Ice Machinery Co.

Edward Chapin Collins, superintendent of the Standard Machinery Co. at Auburn, R. I., died recently at the Rhode Island hospital. Mr. Collins early in life took up machine construction while foreman at the Taunton Locomotive Works. A few years later he became superintendent of the Campbell Printing Press Co., a part of the Mason Machinery plant in Taunton, Mass.

Charles S. Roberts, president of the Wahl Co., Chicago, died May 22 at the Glenview Golf club, Chicago. His home was in Pasadena, Cal., and he was in Chicago on a business trip for his company when death came. He was born at Bloomington, Ill. and was 65 years old. He was the founder of the Wahl Co., manufacturer of computing machinery, refill pencils and fountain pens.

William J. McClain, director and secretary-treasurer of the firm of Waldo, Egbert & McClain, Buffalo, iron and steel sales agents, died May 22. He was 39 years old. Mr. McClain was one of the best known and most popular of the younger steel men in Buffalo. He was born in Niles, O., entered the steel business as a rolling mill worker in the Carnegie Steel Co.'s plant at Youngstown, from where he went to the plant of the Republic Iron & Steel Co., Youngstown. He was placed in charge of district sales for the Buffalo district and served in that capacity for 12 years. He then joined the firm with which he was connected when he died. This firm was formed in March, 1922.

George Adam Rentschler, president of the Hooven, Owens & Rentschler Co., Hamilton, O., died May 24, at his home in that city, following a stroke of apoplexy. He was one of the most widely known manufacturers in the Middle West. Mr. Rentschler was born in Germany, July 7, 1846, but came to America with his parents when he was three years old, locating with them in Newark, N. J. In 1867 he moved to Peru, Ind., where he remained a year. In 1870 Mr. Rentschler came to Cincinnati, where he became the foreman of a foundry. In 1873 he went to Hamilton and built the Deuscher foundry, then known as the Variety Iron Works. In addition to being president of the Hooven, Owens & Rentschler Co. and the Hamilton Foundry & Machine Co., he was vice president of the Phoenix Caster Co., treasurer of the Citizens' Savings Bank & Trust Co., and president and treasurer of the G. A. Rentschler Co.

Compute Freight Income on New Rate Basis

Washington, May 29.—Had the 1923 level of freight rates prevailed all through 1922 the railroads would have received approximately $680,000,000 for the transportation of bituminous coal, $70,000,000 for iron ore, $22,000,000 for pig iron and $135,250,000 for bar and sheet iron, structurals and pipe. In figuring out the return to the railroads the interstate commerce commission has taken the 1922 volume of business and multiplied it by the rates in effect at this time. Since rates were reduced last July, the railroads received higher rates in the first half of 1922 and hence probably had a larger return than the constructive one put out by the commission.

In 1922 a total of 1,023,109,578 net tons of freight originated on the railroads of the United States, for which they received $3,905,542,000, on the basis of 1923 rates. The average return per ton, taking the United States as a single system, was $3.82. The data for leading iron and steel and fuel items are:

Commodity	Tons originating in 1922	Total revenue	Revenue per ton to individual railroad
Bituminous coal	287,235,288	$679,188,000	$1.25
Coke	15,437,961	35,356,000	1.44
Iron ore	52,739,885	70,085,000	0.83
Pig and bloom iron	9,991,387	22,371,000	1.28
Rails, fastenings	2,378,627	8,615,000	1.83
Bar and sheet iron, structurals, iron pipe	22,168,863	135,255,000	2.98
Castings, machinery and boilers	4,227,857	36,907,000	4.08

Slight Reduction in Cost of Living Reported

A slight decrease in the cost of living, due principally to decline in prices of coal is noted for the month ended April 15 in the report just received from the National Industrial Conference board. The decrease between March 15 and April 15was one-tenth of one point, or less than one-tenth of 1 per cent. The cost of living among wage earners' families on April 15 was 59.1 per cent higher than in July 1914. Between July, 1920 when the peak in the rise in the cost of living since 1914 was reached and April, 1923, the cost of living dropped 45.4 points or 22.2 per cent. The accompanying table gives further comparisons.

Living Costs Compared

(Percentage over July, 1914)

July, 1914 to	All items	Food	Shelter	Clothing	Fuel and light	Sundries
Jan., 1920	90.2	97	43	170	49	77
Feb., 1920	93.5	101	45	177	49	78
Mar., 1920	94.8	100	49	177	49	83
Apr., 1920	96.6	100	50	188	51	83
May, 1920	101.6	111	51	187	55	83
June, 1920	103.0	115	51	176	61	85
July, 1920	104.5	119	58	166	66	85
Aug., 1920	103.2	119	58	155	69	85
Sept., 1920	99.4	107	59	155	78	88
Oct., 1920	97.3	103	59	148	83	90
Nov., 1920	93.1	93	66	128	100	92
Dec., 1920	90.0	93	66	105	100	92
Jan., 1921	81.2	78	66	87	100	92
Feb., 1921	76.3	72	66	74	98	90
Mar., 1921	68.7	56	71	74	87	85
Apr., 1921	67.6	56	71	69	79	85
May, 1921	65.7	52	71	68	78	85
June, 1921	61.9	45	71	62	78	85
July, 1921	63.1	48	69	64	79	85
Aug., 1921	62.0	48	69	59	79	83
Sept., 1921	64.8	55	69	57	79	83
Oct., 1921	63.7	53	69	60	79	80
Nov., 1921	63.0	[illegible]	69	61	79	78
Dec., 1921	62.7	52	69	57	79	78
Jan., 1922	61.4	50	69	56	78	78
Feb., 1922	57.7	42	69	56	77	77
Mar., 1922	54.7	39	65	56	74	74
Apr., 1922	54.8	39	65	55	74	74
May, 1922	54.9	39	65	56	74	74
June, 1922	55.4	41	65	53	74	74
July, 1922	55.6	42	65	54	74	74
Aug., 1922	54.5	39	65	53	81	72
Sept., 1922	55.6	40	65	55	87	72
Oct., 1922	57.1	43	65	57	87	72
Nov., 1922	58.4	45	67	60	86	71
Dec., 1922	58.9	47	67	56	87	71
Jan., 1923	58.1	44	67	60	87	71
Feb., 1923	57.5	42	67	62	87	71
Mar., 1923	59.2	42	70	68	86	73
Apr., 1923	59.1	43	70	67	80	73

Revive Reports of British Steel Merger

Washington, May 29.—Active demand for shares on the stock exchange has revived reports that a large British steel merger is under way, states H. B. Allin Smith, assistant American trade commissioner at London, in a report to the department of commerce. The report links Baldwins, Ltd., with the widespread interests of Guest, Keen & Nettlefolds, Ltd. The capital of the former is £8,500,000 and of the latter £13,300,000, involving approximately $100,000,000.

Should the merger be effected, a large part of the South Wales steel industry would be unified, according to Mr. Smith. Some of the properties are in the Midlands, but the majority concerns the sheet, tin plate, nut and bolt and other steel works along the Bristol channel. Showing the large proportion of the South Wales industry that would be involved in this merger, Mr. Smith submits the following table:

	Baldwin's	Guest-Keen's	Combined	Total in South Wales
Blast furnaces	11	14	25	34
Steel furnaces:				
Bessemer converters	..	5	5	11
Open-hearth	62	23	85	149
Iron puddling mills	4	28*	32	12
Rolling mills:				
Total	89	101	190	728
Sheet	36	61	97	193
Tin plate	34*	10	44	477

*Some outside South Wales, in the Midland.

In this area, according to Mr. Smith, are only two other groups of interests, the Ebbw Vale Steel, Iron & Coal Co., and Richard Thomas & Co. The latter controls a large tin plate equipment consisting of a steel bar capacity of 340,000 tons a year and 14 tin plate works aggregating 111 separate mills with an annual capacity of 235,000 tons.

Report on Rolling Stock

Washington, May 29.—On April 15 the railroads had 9.4 per cent of their freight cars, 21.6 per cent of their freight locomotives, 21.6 per cent of their passenger locomotives and 16.8 per cent of their switching locomotives in bad order the interstate commerce commission has reported to the White House. The report for April was made in accordance with the senate resolution asking for monthly statements concerning the condition of railroad equipment.

The United States Steel Corp. will go into the open market to buy 100,000 shares of United Steel common stock between now and Jan. 1, 1924, according to an official announcement. This stock will be distributed to employes next year.

Prospective Tool Demand Large

Bulk of Current Orders Being Confined to Single Tools—Railroad Orders Are Small but Numerous Inquiries Indicate Future Demand of Size —General Industrial Demand Is Fair

ALTHOUGH the bulk of business placed has been in single tools demand for machinery has been of fair proportions. Few large orders have been noted, although in some centers orders appear larger than they have for some time. For the most part, however, the business being done is scattered and limited to small orders indicating buyers are limiting their purchases to actual needs. Railroad demand has been virtually featureless during the past week, the Baldwin Locomotive Works, Eddystone, Pa., and the Chicago Northwestern railroad, being practically the only railroad interests to make large purchases.

General industrial demand is in fair volume. Cleveland machinery dealers report the receipt of several fair-sized orders. Demand from the automobile builders has not been as active as it was, but there still is considerable business being placed by these buyers. Structural and railroad shops, crane builders and heavy machinery manufacturers, appear to be actively in the market for equipment and machinery dealers report the types of equipment used in such plants, is in fairly heavy demand.

Prospective business from the railroads continues large. Lists are being quoted on from the American Locomotive Co., the Chicago Northwestern, the Denver & Rio Grande Western, the Santa Fe., the Pere Marquette, the Nickel Plate and several other roads. An inquiry also is understood to have been placed in the market by the Union Pacific. Business in prospect from general users include inquiries from the Warren, O., board of education, one from a New Hampshire manufacturer for 14 tools, another from a Chicago user for 26 machines and several others. The General Electric Co., Schenectady, N. Y., has been a steady buyer for some time past, and is still in the market. Several projects are nearing the stage where equipment needs will be made known.

Demand for cranes and allied equipment has been holding up fairly well. Orders are not particularly heavy but new inquiries are larger and fairly numerous. An interesting inquiry for cranes is one for 30 cranes wanted for an ice plant at Havanna, Cuba. The General Electric Co. recently placed an inquiry current for 10 electric overhead cranes. Locomotive inquiry is of fair size and new lists include one from the altimore & Ohio railroad for six cranes.

Tool Buyers Limiting Purchases to Single Units

NEW YORK, May 29.—The month now closing has been the slowest in the local machine tool market this year. A fair volume of business has been placed, although for the most part scattered and involving orders for one or two tools. The General Electric Co., as has been the case for several months past, has been by far the most consistent buyer in this district, closing on a number of items most every week. Railroad demand has been virtually featureless, although the railroad equipment companies in some instances have been displaying considerable interest. The Baldwin Locomotive Works, Eddystone, Pa., is one, closing on a substantial list of fabricating equipment, and also a list of 14 cranes. It is still in the market for six 70-ton cranes and also a small list of machine tools. The American Locomotive Co. at present is figuring on about $250,000 of machine tool equipment for a plant at Schenectady, and also cranes. The market the past few days has been practically devoid of any development of consequence.

The Reed-Prentice Co., Worcester, Mass., has sufficient orders to permit of a 100 per cent basis of production, but inability to secure skilled labor at the present time prevents it. The company is operating with 500 men, part of them working overtime, and the force is being increased as rapidly as mechanics become available.

Crane demand, however, has been holding up fairly well, with a good amount of fresh inquiry. Possibly one of the most interesting lists pending is one referred to briefly last week as involving 30 cranes of two tons capacity. They are for a new ice plant in Havanna, Cuba, in which a New York city engineer is in charge. An additional list for the General Electric Co., involving 10 electric overhead cranes, has also recently been brought out. Substantial inquiry is out for locomotive cranes, and includes a new list for the Baltimore & Ohio railroad, involving six 15-ton cranes.

Higher Prices Curtail Buying

PITTSBURGH, May 29.—Advances in machine tool and equipment prices inaugurated in recent weeks have had the effect of curtailing considerable buying activity. Various purchasers after obtaining second or third bids on their requirements, find them prohibitively high and for the time being have deferred action. Others have placed their orders, after being notified of price increases, hoping to get in "under the wire." On these, sellers have had to re-sell their prospects but in many cases have been met with the statement that appropriations at present will not permit of the increased expenditure. However, occasional sales are reported by practically every dealer in the district, only one or two stating that the past week has been without sales or new inquiries. The United Engineering & Foundry Co., has purchased some of the lathes for its Frank Kneeland works. The National Tube Co., has purchased a few items on its large list for the Gary Tube works, including a large $7500 hammer, as well as a lathe and a shaper for its Christy Park works and several small items for Christy

Park as well as Lorain, O., works. The Westinghouse Electric & Mfg. Co., purchased three vertical milling machines on its lists together with some smaller equipment. Unindentified buyers closed on a 6-inch pipe machine, milling machine, lathe and a No. 6 bulldozer. A few additional cranes have been awarded, but new crane inquiries are not developing.

The used machinery market is fairly active, one dealer disposing of a 48-inch lathe for shipment to Cuba, an 8-foot squaring shear to a local buyer while another sold two lathes, one an 18-inch; a post drill, drill press, several hack saws, double-end grinder to local manufacturers and a large bar shear to the Metal & Thermit Corp., South San Francisco. Two or three inquiries for used equipment involve five to seven items each.

Tool Orders Are Larger

CLEVELAND, May 29.—While not particularly large, orders for machinery appear to be gaining in size as the month comes to a close. During the past week several machinery dealers in this district report they have received a number of orders involving as many as six tools. In addition to these, numerous single tool orders have been taken and on the whole the market has been more active than it has in some time. Typical orders include one from a St. Louis user for six tools, consisting of two drill presses, one grinder, one milling machine, one surface grinder and a screw machine. A Pennsylvania manufacturer placed an order with a local dealer for a 3-foot radial drill, one milling machine, one thread miller and one gear cutter. A local manufacturer bought one lathe and two turret lathes, while another Cleveland user took a turret lathe. A Pittsburgh interest placed an order for a large press, a Canton, O., buyer took an 18-inch lathe and numerous other interests bought single machines.

Inquiries continue to run heavy. In addition to the several railroad lists being worked on, which include one from the Santa Fe and another from the Pere Marquette, one from the Denver & Rio Grande Western, and one from the Nickel Plate, numerous inquiries from general manufacturers are current. The Warren, O., board of education has taken bids on five lathes, a New Hampshire manufacturer is actively inquiring here for 14 tools and a Chicago interest has asked for quotations on approximately 26 machines. Local tool manufacturers are reported to be entertaining an inquiry from the Union Pacific railroad, but this has not yet been verified.

Secondhand machinery appears to be favored by buyers, although due to the scarcity of good used tools much business is being turned into new machinery channels. Auction and liquidation sales are fairly numerous and attract considerable attention and interest. During the past week the equipment at the plant of the Grant Lees Gear Co., Cleveland, consisting of approximately 225 tools was auctioned. Most of the machinery went in small lots to dealers, although some users made purchases. Prices obtained are understood to have been low. A local machinery house has obtained the exclusive sale of approximately 200 machines of a Columbus, O., manufacturer, which it plans to put on the market within a few days.

Inquiry for Machinery Falls Off

CHICAGO, May 29.—Inquiry for machine tool equipment is slowing down at Chicago in the experience of most sellers. The general buyer is showing less interest and shoppers are less evident in the stores. This seems to be a pause to determine how far the present cautionary lull in general business will reach. Railroad inquiries, a number of which are before dealers, have not been acted on and except for the purchase of some engine lathes asked for in the Chicago & Northwestern list no business has resulted from these activities. The remainder of the Northwestern list is being held in abeyance but is expected to be placed before long. The Denver & Rio Grande Western list is also being held under consideration and some question now exists how much of this will be placed with Chicago dealers. May has not produced much business and promises to be the least profitable of the present year. Machine tool users are slow to close for what equipment they feel they should have and a change in the outlook probably would bring a resumption of buying.

Crane Awards and Inquiries of the Week

Orders Placed

One 60-ton electric overhead crane for the city of Seattle; three 5-ton cranes, 41-foot span, for the J. L. Mott Iron Works, Trenton, N. J.; one 200-ton locomotive hoist, for the Nickel Plate railroad and one 10-ton electric overhead crane, 47-foot span, and one 4-ton electric crane, 22-foot span, for the Orton & Steinbrenner Co., Chicago, all to the Whiting Corp.

One electric overhead crane and one gate hoist for a hydroelectric plant for the Twin States Gas & Electric Co., Boston, to an unnamed builder.

One electric overhead crane for the Hopedale Mfg. Co., Hopedale, Mass., placed, the order reported going to Shepard Electric Crane & Hoist Co.

One 25-ton locomotive crane for the Chester, Pa., plant of the American Locomotive Co., to the Ohio Locomotive Crane Co.

One 20-ton locomotive crane for the Mohawk Carpet Co., Amsterdam, N. Y., to the Ohio Locomotive Crane Co.

One 3-ton electric crane, 38-foot span, for the American Car & Foundry, to an unnamed builder.

One 1000-foot tramrail system for the Trenton Potteries, Trenton, N. J., to the tramrail division of the Cleveland Crane & Engineering Co.

One 50-ton electric overhead crane, equipped with two 25-ton hoists and two 2-ton electric overhead cranes for the United Fruit Co., 17 Battery place, New York City, to the Whiting Corp.

One 15-ton, 1-motor crane, for the Phoenix Utility Co., 71 Broadway, New York City, placed, the order reported as going to the Northern Engineering Works.

One 200-ton transfer table and one 15-ton electric crane, 72-foot span, for the Missouri Pacific railroad, to the Whiting Corp.

One 50-ton electric overhead crane for the city of St. Paul Gas Light Co., St. Paul, Minn., to the Whiting Corp.

Two 5-ton cranes with 47-foot span for the Witherow Steel Co., Neville Island, Pittsburgh, to the Bedford Foundry & Machine Co., Bedford, Ind., through the L. A. Green Rail & Machinery Co., Pittsburgh.

One used 5-ton Shaw crane to steel company in the Pittsburgh district to an unnamed seller.

One 5-ton crane for the Follansbee Bros. Co., Follansbee, W. Va., to the Pawling & Harnischfeger Co., Milwaukee, Wis.

Orders Pending

Conveying equipment for a pier shed for the dock department at Roosevelt street, New York City; general contractor's bids closed May 29.

One 30-ton gantry crane, 5-ton auxiliary, for the Lehigh Valley railroad; tentative figures were reported as asked in this listing three or four weeks ago.

Two electric overhead cranes, one of fairly large capacity, for power house operation, for the Philadelphia Rapid Transit Co., bids asked.

Overhead crane equipment for a new plant to be erected by the Metropolitan Edison Co. at Middletown, Pa.; specifications expected out soon.

Ten electric overhead cranes, ranging from 3 to 15 tons capacity, for the General Electric Co., Schenectady, N. Y.; it is now estimated that about 35 overhead cranes are now pending for the various plants of this company, some of which may be alternates.

Six 15-ton overhead cranes, 30-foot boom, and equipped with 1½-yard buckets, for the Baltimore & Ohio railroad.

Two locomotive cranes for the Chesapeake & Ohio railroad, tentative bids asked.

Thirty overhead cranes, 2 tons capacity each, for a new ice plant to be erected in Havana, Cuba; Ophules & Hill, Inc., 112 West Forty-second street, New York City, engineer in charge; this list was referred to last week as being for a New York ice company; specifications expected out soon.

One 10-ton, floor-operated, electric crane, 26-foot span, for export by the Czarnikow-Rionda Co., 112 Wall street, New York City; inquiry revived.

One 3000-pound monorail system, equipped with 1-ton hoist, for the Standard Oil Co. of New Jersey, 26 Broadway, specifications being revised.

One 10-ton, single trolley crane, 67-foot span, for the Chester, Pa., plant of the American Locomotive Co., and one 10-ton trolley, for a crane now already installed at Schenectady; this is in addition to the four cranes reported in a recent issue as pending.

One 5-ton crane for the Reliance Steel Casting Co., Pittsburgh; bids being tabulated.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

BOSTON, MASS.—The Saco Lowell Shops, Walker street, has awarded a contract for the erection of a 3-story manufacturing building.

BOSTON—The Edison Electric Illuminating Co., 39 Boylston street, plans the erection of a 1-story power house.

SPRINGFIELD, MASS.—The Le Bouef Fountain Pen Co. is taking bids for the erection of a 1-story factory building to be built at an estimated cost of $9000.

WALTHAM, MASS.—The Boston Mfg. Co. is having plans drawn for the erection of an addition to its plant, 60x165 feet.

WESTFIELD, MASS.—The H. B. Smith Co. will start work soon on the erection of a 1-story foundry building.

WORCESTER, MASS.—The Gendall Equipment Corp. has been incorporated with $100,000 capital by John S. Gendall, Woodmont, Conn., Clarence F. Wood and John G. Wragg, New London, Conn.

WORCESTER, MASS.—The St. Pierre Chain Corp. has been incorporated with $200,000 capital by Henry St. Pierre, William Lainer and Thomas St. Pierre, Williamstown, Vt.

BATTLE CREEK, MICH.—The Michigan Metal Products Co. plans the erection of a 1-story factory building, 60 x 100 feet, to be built at an estimated cost of $30,000.

DETROIT—The John Bramer Tool & Machine Co. plans to erect a 1-story factory building at New Baltimore, Mich., to be built at an estimated cost of $30,000.

FLINT, MICH.—The Martin Parry Corp., York, Pa., contemplates the erection of a plant here.

GRAND RAPIDS, MICH.—A plant is being erected here for the Gallmeyer-Livingston Co.

HOLLAND, MICH.—The Federal Stamping Co. has had plans drawn for the erection of a 1-story plant building to be built at an estimated cost of $100,000.

IRON MOUNTAIN, MICH.—The Michigan Land & Lumber Co. is having plans drawn for the erection of a sawmill addition.

NEW HAVEN, MICH.—The plant of the New Haven Foundry recently was damaged by fire.

PONTIAC, MICH.—The Oakland Body Corp., Baldwin avenue, has plans for the erection of a plant addition including a power house, 85 x 115 feet, to be built at an estimated cost of $100,000.

ST. JOSEPH, MICH.—The Williams Bros. Paper Box Mfg. Co., St. Joseph, Mich., is taking bids for the erection of an addition to its plant, three stories, to be built at an estimated cost of $8000.

FRANKLIN, N. H.—The G. W. Griffin Co. maker of hack saw blades, is to erect a factory addition and a new building for its tempering department.

BROOKLYN, N. Y.—The Eberhard Faber Pencil Co., 37 Greenpoint avenue, has awarded a contract for the erection of a plant building, 80 x 195 feet, to be built at an estimated cost of $350,000.

BROOKLYN, N. Y.—The Brooklyn Nipple & Pipe Works, Inc., 553 Van Siclen avenue, has been incorporated with $30,000 capital stock to manufacture pipe and fittings, by T. and R. Frascella and F. Pelletiere.

BUFFALO—The Fillmore Avenue Foundry & Iron Works, Inc., 153 Fillmore avenue, plans the erection of a 1-story foundry addition.

BUFFALO—The Truck Equipment Co., 1016 Lafayette avenue, plans the erection of a 1-story plant building.

BUFFALO—George Laub & Sons, 1051

Industrial Business Changes Recently Announced

SINCE May 1 the name of the St. Louis Coke & Chemical Co., St. Louis, has been the St. Louis Coke & Iron Co., the corporate style having been changed. The company is the larges producer of pig iron in the St. Louis district.

* * *

Lyons-Clarke Engineering Co., Pittsburgh, has moved its offices to 411 Penn avenue.

* * *

The National Bread Wrapping Machine Co., Nashua, N. H., will remove to its new plant in Broad street, about July 1.

* * *

Offices of the United States Iron & Steel Co., New York, have been moved from the Woolworth building to No. 2 Rector street.

* * *

General offices of the Hudson City Steel Corp., New York, have been moved from the Woolworth building to No. 2 Rector street.

* * *

The Quebec Brass & Foundry Co. has moved its plant and offices from 111 Mountain Hill to 55½ Commerciale street, Levis, Que.

* * *

The Gibb Instrument Co., Bay City, Mich., as been appointed distributor of the General Electric Co.'s arc welding electrodes in the Middle West.

* * *

The Rogers-Brown Co.'s St. Louis offices, which for a number of years have been located in the Security building, will be moved shortly to the Planters building.

* * *

Pilling & Co. have been appointed exclusive agents for the sale of Chateaugay pig iron, produced by the Chateaugay Ore & Iron Co.

* * *

For the purpose of more closely co-operating with the industries in Philadelphia and vicinity the Norton Co., Worcester, Mass., has opened a branch office at 3208-10 Market street, Philadelphia.

* * *

District sales offices have been opened in Buffalo at 303 White building, by the Moltrup Steel Products Co., Beaver Falls, Pa., in charge of Charles T. Neale, as district sales manager.

* * *

The Consolidated Machine Tool Corp. of America, 17 East Forty-second street, New York, has opened a district sales office in the General Motors building, Detroit, in charge of Rowland A. Holmes.

Warehouse Steel Prices

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.515c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Cleveland	3.36c
Detroit	3.35c
Los Angeles	3.85c
New York	3.54c
Philadelphia	3.55c
San Francisco	4.00c
Seattle	4.10c
St. Louis	3.35c
St. Paul	3.45c

IRON BARS

Boston	3.515c
Buffalo	3.50c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Detroit	3.35c
New York	3.54c
Philadelphia	3.55c
St. Louis	3.35c

SHAPES, STRUCTURAL

Boston	3.615c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Los Angeles	3.95c
New York	3.64c
Philadelphia	3.65c
San Francisco	4.10c
Seattle (large shapes)	4.20c
St. Louis	3.45c
St. Paul	3.55c

PLATES

Boston	3.615c
Boston 3/16-inch	3.04c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Detroit, 3/16-inch	3.45c
Los Angeles	3.65c
New York	3.64c
Philadelphia	3.65c
Philadelphia, 3/16-inch	3.95c
San Francisco	4.10c
Seattle	4.25c
St. Louis	3.45c
St. Paul	3.55c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.615c
Buffalo	4.45c
Chicago	4.35c
Cincinnati	4.10c
Cleveland	3.90c to 4.06c
Detroit	4.30c
Los Angeles	5.20c
New York	4.59c
Philadelphia	4.25c
San Francisco	5.00c
Seattle	4.75c
St. Louis	4.45c
St. Paul	4.60c

NO. 28 BLACK SHEETS

Boston	5.75c
Buffalo	5.25c
Chicago	5.20c
Cincinnati	4.90c
Cleveland	4.75c
Detroit	5.15c
Los Angeles	6.50c
New York	5.15c
Philadelphia	5.15c
San Francisco	6.30c
Seattle	5.75c
St. Louis	5.20c
St. Paul	5.45c

NO. 28 GALVANIZED SHEETS

Boston	6.90c
Buffalo	6.35c
Chicago	6.35c
Cincinnati	5.90c
Cleveland	5.90c
Detroit	6.30c
Los Angeles	7.30c
New York	6.15c
Philadelphia	6.25c
San Francisco	7.15c
Seattle	6.75c
St. Louis	6.35c

BANDS

Boston	4.80c
Buffalo	4.35c
Chicago	3.95c
Cincinnati	4.00c to 4.10c
Cleveland	4.01c to 4.16c
Detroit	4.10c
Los Angeles	4.60c
New York	4.39c
Philadelphia	4.35c
San Francisco	4.75c
Seattle	5.10c
St. Paul	4.20c

HOOPS

Boston	5.80c
Buffalo	4.65c
Chicago	4.55c
Cleveland	4.01c to 4.16c
Detroit	4.95c
New York	5.19c
Philadelphia, 1 inch and wider 20 gage and heavier	4.75c
Seattle	5.50c
St. Paul	4.80c

COLD ROLLED STEEL

Boston (rounds)	4.75c
Boston (shapes)	5.25c
Buffalo (rounds)	4.70c
Buffalo (shapes)	5.20c
Chicago (rounds)	4.55c
Chicago (shapes)	5.05c
Cincinnati (rounds)	4.50c
Cincinnati (shapes)	5.00c
Cleveland (rounds)	4.25c
Cleveland (shapes)	4.75c
Detroit (rounds)	4.55c
Detroit (shapes)	5.05c
Los Angeles (rounds)	5.40c
New York (rounds)	4.65c
New York (shapes)	5.15c
Philadelphia (rounds)	4.35c
Philadelphia (shapes)	4.85c
San Francisco (rounds)	5.50c
Seattle (rounds)	6.00c
St. Paul (rounds)	4.55c

Clinton street, plans the erection of a 1-story power house to cost about $25,000.

BUFFALO—The Donner-Union Coke Co., Abby street, plans the erection of a 1-story car repair shop.

NEW YORK—The Kovat & Knauber Iron Works, Inc., 800 Edgewater road, plans to erect a 1-story plant building, 100 x 150 feet, to be built at an estimated cost of $30,000.

NEW YORK—The Capitol Iron Works has been incorporated with $10,000 capital stock by H. and H. Slaman and A. Greenfield. The company is represented by H. Rosenthal, 220 Broadway.

NEW YORK—The Christopher Machine Works has been incorporated with $30,000 capital stock by J. A. Bolen, S. F. Meyer and H. J. Hacker. The company is represented by B. Fensler, 1182 Broadway.

NEW YORK—The Elk Machine Tool Corp. has been incorporated with $112,000 capital stock by J. G. Elkin, C. K. Thomas and H. I. Lurie. The company is represented by Lurie & Feinburg, 38 Park Row.

ROCHESTER, N. Y.—The Co-Operative Foundry Co. plans improvements and additions to its plant.

ROCHESTER, N. Y.—The Broadway Motor Truck Co., 190 South avenue, plans the erection of a 1-story addition.

ROCHESTER, N. Y.—Staub & Son, Inc., 951 Main street, plans the erection of a 1-story power house.

CINCINNATI—The Glow Electric Co. plans to start work soon on the erection of a plant in Second street.

CINCINNATI—The C. L. Greene Co., manufacturer of wire springs, plans the erection of an addition to its plant.

CLEVELAND, O.—The Cleveland Folding Bed Co., 3305 Broadway, plans the erection of a 1-story factory building.

CLEVELAND, O.—The Stotter Metal Co. has been incorporated with $10,000 capital stock by L. B. Stotter, R. S. Horan, M. Mergner, J. B. Kiefer and E. R. Walter.

COLUMBUS, O.—The Buckeye Wire & Iron Co. is erecting a factory building.

DAYTON, O.—The Non-Ferrous Metal Co. has been incorporated with $11,000 capital stock by B. R. Shaman, R. E. Mars, Samuel Froehle, J. C. Kusworm and Irving Braunstein.

DEFIANCE, O.—The Kruse-Wierk Mfg. Co., recently incorporated with $50,000 capital stock, has started work on the erection of a plant to be devoted to the manufacture of metal containers.

ELYRIA, O.—The Colson Co. has obtained a permit to erect a 4-story factory building at an estimated cost of $100,000.

CHESTER, PA.—The P. & A. Spark Plug Co. is being organized with $1,000,000 capital stock by John T. Callahan and others.

CRESSON, PA.—The Link Motor Co. plans the erection of a 2-story plant building, 70 x 100 feet, to cost about $35,000.

GREENVILLE, PA.—The Chicago Bridge & Iron Works, 608 South Dearborn street, Chicago, plans to erect an addition to its plant here.

GROVE CITY, PA.—The Bessemer Gas Engine Co. plans to start work soon on the erection of two factory buildings one 60x180 feet, and the other 75x180 feet. John Carruthers is president of the company.

JOHNSTOWN, PA.—The Trabold Motor Co., 429 Swank building, plans the erection of a 1-story building, 90 x 222 feet.

LEWISTON, PA.—The Pennsylvania Wire Glass Co., 914 Pennsylvania building, Philadelphia, contemplates the erection of a plant here to be built at an estimated cost of $75,000.

POTTSTOWN, PA.—The Glasgow Iron Co. has awarded a contract for the erection of a 1-story plant addition, 100 x 275 feet.

READING, PA.—The Metropolitan Edison Co. plans the erection of a power house, 31 x 100 feet.

CRANSTON, R. I.—The Kenney Mfg. Co. has awarded a contract for the erection of a plant addition, 42 x 65 feet.

CHARLESTON, W. VA.—The Virginia Power Co. plans improvements at its plant.

CHARLESTON, W. VA.—The Evans Lead Co. has started work on the erection of a plant building, one story, 70 x 120 feet.

MARTINSBURG, W. VA.—The United Steel Car Co., recently organized, plans to erect a plant including a foundry, machine shop and car repair shop.

NITRO, W. VA.—The Fulton Container Co. plans to erect a plant at an estimated cost of $40,000. David A. Jayne is president of the company which recently was organized.

APPLETON, WIS.—The Fox River Paper Co. has contracted for a 500-horsepower boiler for installation in the Telulah mill. A 750 k. w. turbine was installed during the past winter.

LA CROSSE, WIS.—Bids are being taken until June 7 for the erection of the new La Crosse vocational school, plans for which have

Bourne-Fuller Service

includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

Warehouses

If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke

CLEVELAND

New York **Chicago** **Detroit**
San Francisco]
Cincinnati

been completed by Architect Otto A. Merman. It will be one and two stories high, 142x206 feet, and with equipment of metal and woodworking shops, kitchens, etc., will cost about $200,000.

MADISON, WIS.—H. J. Loftsgordon has leased his large sand and gravel lands near Madison to the Waukesha Washed Sand & Gravel Co., Loan & Trust building, Milwaukee, which will install machinery and equipment costing $50,000. George Brew is president.

MANITOWOC, WIS.—The Invincible Metal Furniture Co. has let contracts for the erection of a 1-story plant addition, 90 x 200 feet, to cost about $30,000.

MANITOWOC, WIS.—A new punch and shear shop, 90x200 feet, will be built by the Invincible Metal Furniture Co. Machinery is now being ordered. The Invincible company specializes in steel cabinets, safe deposit boxes and similar products.

MEDFORD, WIS.—Frindell Bros. Motor Co. is having plans prepared by Architect J. G. Schneider of Arcadia, Wis., for a $25,000 garage and repair shop, 50x146 feet, 1-story and basement. Bids will be taken June 15.

MILWAUKEE, WIS.—Articles of incorporation have been filed by the Morgan Frog & Crossing Co., capitalized at $25,000. The concern will manufacture a line of railroad specialties patented by Ben J. Morgan, 490 Van Buren street. Other incorporators include J. H. Cunningham and J. J. Washecheck.

PHILLIPS, WIS.—A bond issue of $50,000 for the construction of a water work plant was adopted at a special election held here May 15. An engineer will be selected at once.

RHINELANDER, WIS.—A 20-ton ice machine, with corliss engine will be needed by the S. Miller Fruit Co. of Marshfield, Wis., for a new branch cold storage plant to be erected here. It will be 40x120 feet, 3-story and basement and will cost complete about $125,000. The work is in charge of Architects M. & R. Carpenter, 105 North Clark street, Chicago.

SHEBOYGAN, WIS.—The Christ Zelle & Son Co., 1216 Michigan avenue, plans to rebuild its 1-story shop building recently damaged by fire, at an estimated cost of $20,000.

Throughout The West

EMERYVILLE, CAL.—The Detroit Steel Products Co., Detroit, has acquired a site here on which it is reported planning to erect a plant.

OAKLAND, CAL.—The Union Metal Prod-

(*Continued on Page* 1636)

New Trade Publications

SLUICE GATES AND HOISTS.—The Champion Engineering Co., Kenton, O., is distributing five leaflets illustrating the caterpillar type sluice gates manufactured by the company. It also described the company's hand and power operated sluice gate hoists.

ARC WELDERS.—A 4-page illustrated folder has been published by the Allan Mfg. & Welding Corp., Buffalo, in which electric arc welders are described and illustrated. These welding with polyphase alternating current arc welders are constructed for primary voltage and cycle.

SAND CUTTING MACHINE.—The American Foundry Equipment Co., New York, has published a 4-page illustrated folder in which a foundry sand cutting machine is described and illustrated. This machine has a depth of cut up to three feet, and it completely cuts and piles a heavy 30-foot floor in four to five minutes, according to the folder.

OFFICE AND FACTORY EQUIPMENT.—The Angle Steel Stool Co., Plainwell, Mich., has published a 40-page illustrated booklet in which steel stools, chairs, benches and factory equipment is described and illustrated. The factory equipment includes trucks for light and heavy transportation, tables, cabinets, etc.

ELEVATORS.—The Warner Elevator Mfg. Co., Cincinnati, has published a 4-page illustrated folder in which attention is called to the company's new plant addition. The addition is to be devoted to the building of passenger and freight elevators. Two interior views of the addition are given, one showing the main floor and the other the south wing of the structure.

TAPPING EQUIPMENT.—William L. Procunier, Chicago, has published a small illustrated folder in which the company's line of double-jaw tapping equipment is described and illustrated. This consists of safety tapping attachments, positive tapping attachments, safety tapping chucks, tap holders, releasing safety tapping chucks for screw machines and releasing tap holders for screw machines.

STEEL STOCK LIST.—P. F. McDonald & Co., Boston, has published a 60-page booklet containing lists of the various stocks of steel it carries. The company represents Fagersta Bruks Aktiebolag, Fagersta, Sweden; Sandvik Steel Works, Ltd., Sandviken, Sweden; and the Page Steel & Wire Co., Monessen, Pa. The published lists are of stock actually in the company's warehouse at the time of publication.

FOUNDRY MATERIAL HANDLING EQUIPMENT—The Link-Belt Co., Chicago, has issued a large booklet describing its various classes of conveying equipment for foundries. This includes locomotive cranes, belt conveyors, mold conveyors, sand handling equipment and devices for preparing and revivifying the molding sand. While considerable space is devoted to descriptions, the bulletin is largely given over to halftone illustrations showing actual installations of Link-Belt equipment.

PNEUMATIC ROTARY BRUSH.—J. W. Paxson Co., Philadelphia, has published a circular in which a pneumatic rotary brush is described and illustrated. The object of the brush is to clean flat surfaces such as iron, steel and brass castings, steel cars, trucks, wagons, tanks, steel and iron sheets, stone, cement, wood, etc. Specifications are length overall, 12 inches; weight 7½ pounds; air inlet, ¼ inch; air pressure, 50 pounds and speed, 500 revolutions per minute.

DRAFT GAGE.—The Foxboro Co., Inc., Foxboro, Mass., has published a 4-page folder in which a triplex draft gage is described and illustrated. The gage is said to take up a minimum of space and is easy to install on any boiler front or gage board. It is dust-tight and moisture-proof. According to the folder the diaphragm tube movement responds to the slightest pressure change. The folder states it has no complicated or delicate parts and is unaffected by temperature, vibration and barometric pressure.

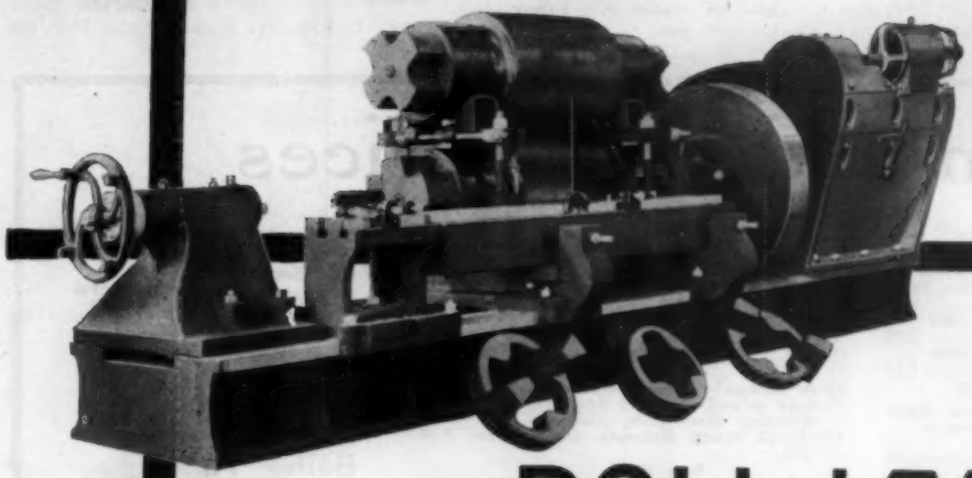
DUST ARRESTERS.—The American Foundry Equipment Co., New York, is circulating six booklets in which its foundry equipment is described and illustrated. One booklet is devoted to dust arresters, a second to sandblast barrels of the gravity and pressure types, a third to sand blast rooms of the down draft type, a fourth to rotary table and sand blast rooms, a fifth to automatic rotary sand blast tables for sand blasting articles requiring unusual care and a sixth to sand blast pressure tanks.

March Tool Exports Decline

FIGURES recently issued by the United States department of commerce, bureau of foreign and domestic commerce show that during March 2993 *tools were exported. This is a decline as compared with exports of* 4884 *machines in February but is an increase as compared with* 1786 *tools in March,* 1922. *During the first three months of the year exports total* 12,464 *machines, which compares with* 4743 *tools in the same period of last year. Individual returns and comparisons follow:*

	March		Three months ending March	
	1923	1922	1923	1922
Lathes	85	112	1,851	187
Boring and drilling machines	237	168	722	451
Planers, shapers and slotters	18	18	36	50
Bending and power presses	19	19	54	68
Gear cutters	7	2	32	84
Milling machines	23	41	77	87
Thread cutting and screw machines	54	47	489	115
Punching and shearing machines	27	23	69	58
Power hammers	49	15	102	73
Rolling machines	2	5	8	8
Sharpening and grinding machines	1,639	669	5,772	1,975
Pneumatic tools	833	667	3,252	1,587
Total	2,993	1,786	12,464	4,743

LEWIS



ROLL LATHES

Thoroughly modern lathes incorporating all the latest improvements to provide continued and efficient service.

The Headstocks are of the enclosed type, dust proof; the Gears, all steel with cut teeth, being lubricated by the splash system and the Bearings by gravity feed.

When Motor driven, a variable speed motor is employed (requiring direct current) and a speed change device is included when wanted, to provide double the speed variation.

We build Lathes in 16", 18", 26", 34" and 42" sizes, with or without change speed Gears for direct current motor drive, and with Cone Pulleys for belt drive where direct current is not available.

Send us your inquiries.

LEWIS FOUNDRY & MACHINE CO.

1502 Farmers Bank Bldg.

Pittsburgh, U. S. A.

WE ALSO MAKE

Rolls, Merchant and Plate
Cold Strip Mills
Neale Patent Reel for Cold Strip Steel
Rolling Mills for
Sheet and Tin Plate
Strip Steel
Merchant Bars
All Non-Ferrous Metals
Shears—Roll Lathes
Rolling Mill Machinery
Special Machinery

Specific details, estimates and plans for any of the above on request.

West of the Mississippi

(*Continued from Page* 1634)

ucts Co. has been incorporated with $500,000 capital stock by F. C. Seeger, E. J. Hultman, A. J. Kercher, S. J. Taylor and others.

STOCKTON, CAL.—The Nims Pump Co., recently organized with $150,000 capital stock, plans to erect a plant building.

VERNON, CAL.—The plant of the Gorham Engineering Co. recently was damaged by fire.

DES MOINES, IOWA—The Des Moines Steel Co. plans the erection of a 1-story plant addition, 65 x 100 feet.

LEON, IOWA—John Penniwell has started work on the construction of a building, 56 x 72 feet, to be used as a machine shop and garage by E. L. Cain.

ST. LOUIS—The Utility Tool Co., 620 Tower Grove avenue, plans to erect a plant building.

ST. LOUIS—The Columbia Can Co., 128

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES

Per Gross Ton Lower Lake Ports

Old range Bessemer, 55 per cent iron	$6.45
Mesabi Bessemer, 55 per cent iron	6.20
Old Range nonbessemer, 51½ per cent iron	5.70
Mesabi nonbessemer, 51½ per cent iron	5.55

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 53 to 63 per cent	10.00 to 11.00
Copper free low phosphorus 53 to 65 per cent	13.25 to 16.50

FOREIGN IRON ORE

Cents per unit, c.i.f. Atlantic ports

Spanish low phosphorus, 52 to 54 per cent	nominal
Algerian low phosphorus, 52 to 54 per cent	11.25
Swedish and Norwegian low phosphorus, 68 per cent	nominal
Swedish foundry or basic, 66 to 68 per cent	9.50 to 10.50
Spanish foundry or basic, 50 to 54 per cent	9.00 to 10.00

Manganese Ore

Prices do not include duty at rate 1 per cent per pound of metallic manganesese contained.

Brazilian, minimum 47 per cent ..... 43½ cents c.i.f. tidewater

Indian, minimum 47 per cent ..... nominal

Caucasian, 53 to 55 per cent ..... 47 cents c.i.f. tidewater

Fluor Spar

85 and 5% grade

Washed gravel, Kentucky and Illinois mines, per ton ..... 21.50 to 22.00

Rivets

Structural rivets, Pittsburgh	3.25c
Boiler rivets, Pittsburgh	3.35c
Rivets, 7/16-in. and smaller	60 and 5 off

Nuts and Bolts

NUTS

(Up to 1¼ and 1½ inches inclusive)

Hot pressed square or hexagon blank	$3.00 off list
Hot pressed square or hexagon tapped	$2.75 off list
Cold punched square or hexagon blank	$3.00 off list
Cold punched, square or hexagon, tapped	$2.75 off list
Cold punched semifinished hexagon nuts ⅝-inch and larger	70-10-2½ off
Cold punched semifinished hexagon nuts 9/16-inch and smaller	70-10-5 off

Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	45 off
Cut thread	40 off
Larger and longer	40 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	50 off
Cut thread	40-10 off
Larger and longer	40-10 off

(⅜ x 4 inches, cold punched nuts)

Cut thread	35-5 off
Larger and longer	35-5 off
Lag screws	50 off
Plow bolts Nos. 1, 2 and 3 heads	40-10 off
4 to 10 heads	40-10+20 off
Stove bolts	75-5 off
Tap bolts	25 off
Bolt ends with hot pressed nuts	40-10 off
Bolt ends with cold punched nuts	35-5 off
Blank bolts	40 off
Rough stud bolts with nuts	40 off

WASHERS

Wrought washers ..... $4.85 to $5.00

Steel Pipe

(First column*—effective March 19, 1923)
(Second column—effective April 19, 1923)
*Wheeling Steel Corp. discounts.
Pittsburgh basing discounts, jobbers' carloads.

	Black	Galvanized
Butt Weld		
⅛-inch	44 to 45	18½ to 19½
¼ and ⅜-inch	50 to 51	24½ to 25½
½-inch	55 to 56	41½ to 42½
¾-inch	59 to 60	47½ to 48½
1 to 3-inch	61 to 62	49½ to 50½
Lap Weld		
2-inch	54 to 55	42½ to 43½
2½ to 6-inch	58 to 59	46½ to 47½
7 to 8-inch	55 to 56	42½ to 43½
9 and 10-inch	54 to 54	41½ to 41½
11 and 12-inch	54 to 53	41½ to 40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	59 to 60	47½ to 48½
Lap Weld		
2-inch	52 to 53	40½ to 41½
2½ to 6-inch	56 to 57	44½ to 45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅜-inch	40 to 41	23½ to 24½
¼ and ⅜-inch	46 to 47	29½ to 30½
½-inch	52 to 53	41½ to 42½
¾-inch	57 to 58	46½ to 47½
1 to 1½-inch	59 to 60	48½ to 49½
2 to 3-inch	60 to 61	49½ to 50½
Lap Weld		
2-inch	52 to 53	41½ to 42½
2½ to 4-inch	56 to 57	45½ to 46½
4½ to 6-inch	55 to 56	44½ to 45½
7 to 8-inch	51 to 52	38½ to 39½
9 and 10-inch	45 to 45	32½ to 32½
11 and 12-inch	45 to 44	32½ to 31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	41 to 42	31½ to 32½
¾ to 1½-inch	44 to 45	34½ to 35½
2 to 2½-inch	46 to 47	36½ to 37½
Lap Weld		
2-inch	40 to 41	31½ to 32½
2½ to 4-inch	42 to 43	33½ to 34½
4½ to 6-inch	41 to 42	32½ to 33½
7 to 8-inch	37 to 38	24½ to 25½

Wrought Iron Pipe

(Effective Jan. 23, 1923)

Pittsburgh basing discounts, jobbers, carloads

THREADS AND COUPLINGS

	Black	Galvanized
Butt Weld		
⅛ and ¼-inch	+11	+39
⅜-inch	22	2
½-inch	28	11
¾-inch	30	13
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
7 to 8-inch	28	13
9 to 12-inch	26	11

PLUGGED AND REAMED
Two points less than above

EXTRA STRONG, PLAIN ENDS

Butt Weld		
⅛ and ¼-inch	+19	+54
⅜-inch	21	7
½-inch	28	12
¾-inch	30	14
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	..

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL (Lap welded)
(Effective April 19, 1923)

2 and 2¼-inch	23 off
2½ and 2¾-inch	33 off
3-inch	36 off
3¼ to 3¾-inch	38½ off
4 to 13-inch	42 off

CHARCOAL IRON
(Effective April 12, 1923)

1½-inch	+22
1¾-inch	+12
2 and 2¼-inch	+ 2
2½ to 3-inch	3
3¼ to 4½-inch	5

SEAMLESS COLD DRAWN
(Effective April 19, 1923)

1-inch	51 off
1¼ and 1½-inch	43 off
1¾-inch	27 off
2 and 2¼-inch	18 off
2½ and 2¾-inch	28 off
3 and 3¼-inch	32 off
3½ and 3¾-inch	33 off
4-inch	37 off
4½ and 5-inch	29 off

SEAMLESS HOT ROLLED

3 and 3¼-inch	34 off
3½ and 3¾-inch	35 off
4-inch	39 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras: ... ...

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts

Carbon, 0.10 to 0.20 per cent	83 off
Carbon, 0.30 to 0.40 per cent	81 off
Carbon, 0.40 to 0.50 per cent	80 off

Plus differentials and extras for cutting

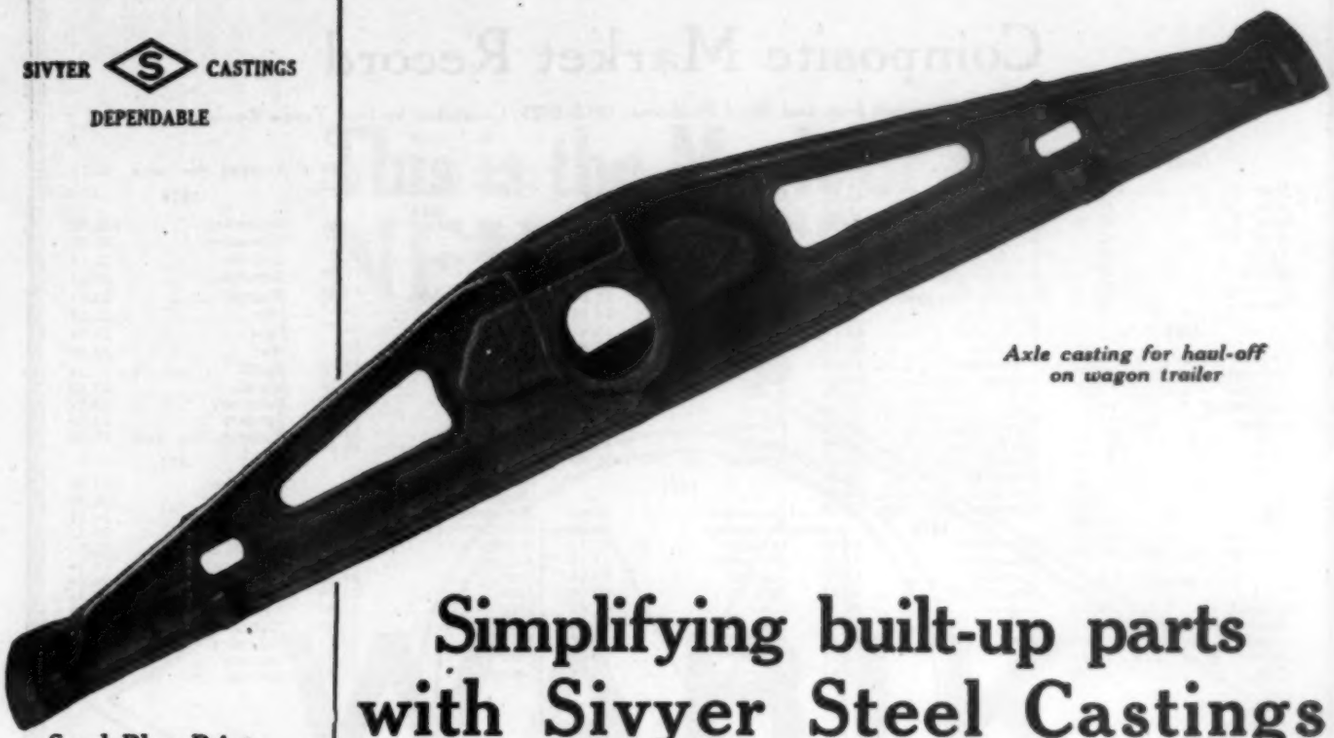
SEAMLESS STEEL LOCOMOTIVE AND SUPER-HEATER TUBES
(Effective April 19, 1923)

Outside diameter	Gage	Net prices per foot, f.o.b. Pittsburgh Price
2-inch	12-gage	15c
2-inch	11-gage	16c
2-inch	10-gage	17c
2¼-inch	12-gage	17c
2¼-inch	11-gage	18c
2¼-inch	10-gage	20c
3-inch	7-gage	35c
1½-inch	9-gage	15c
5½-inch	9-gage	55c
5½-inch	9-gage	57c

Plus usual extras for forming and for long lengths.

SIVYER CASTINGS

DEPENDABLE



Axle casting for haul-off on wagon trailer

Simplifying built-up parts with Sivyer Steel Castings

A MANUFACTURER of trucks and trailers formerly built up the haul-off for a wagon trailer with steel straps, bolts and pieces of wood. In this process he used fifty-four pieces of material consisting of twenty-nine bolts, eight steel straps, four iron castings, two U bolts, two strap bolts, two hook bolts, two steel plates and five pieces of wood. To simplify the construction of the part he turned to Sivyer Steel and now uses a total of only eighteen pieces consisting of four Sivyer Castings, ten straight bolts, two rods and two steel straps. The result to him is a considerable reduction of assembly cost and a much stronger and simpler unit. Other manufacturers have made similar gains by replacing built up parts with stronger and less complicated units of Sivyer Electric Steel Castings.

Send Blue Prints

A number of aggressive manufacturers have divided their steel parts into three general classes: those that can be profitably forged; those that cannot be forged economically, or at all, but can be cast in ordinary steel; and those that can be cast most reliably and economically in Sivyer Electric Steel.

The last class includes especially castings with thin and sharply varying sections, and castings that have to be true to pattern, clean and smooth in order to fit the assembly with the minimum of finishing.

With Sivyer Electric Steel we have been able to show certain engineers very decided advantages and economies, not only as against ordinary steel castings and hammered forgings, but also as against malleable castings and fabricated steel.

A certain manufacturer formerly fabricated rocker beams for a crawler chassis by welding two stampings and then pressing in, and welding, sections of steel tubing. The shortcomings, and unnecessary expense of this method were not realized until it was found that the stampings did not have the body required to carry certain desirable attachments. Forgings were impractical. Open hearth practice does not permit the high temperatures necessary for casting thin sections such as those of the design in question. The manufacturer's organization naturally turned to Sivyer Electric Steel. It proved to have all the qualities desired and effected an appreciated reduction in the final cost of the part.

In a number of other cases we have been able to free certain engineers from the handicaps of hammered forgings and in effect give them much greater freedom in design.

We are especially interested in making experimental castings for manufacturers. If you will send us your blue prints for troublesome parts, together with a statement of your difficulties, we will study the problems involved and recommend possible solutions without obligation on your part.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

Composite Market Record

Monthly Averages of Fourteen Iron and Steel Products, 1913-1923, Compiled by Iron Trade Review

1923	
May 23	$47.44
May 16	47.48
May 9	47.70
May 2	47.70
April	47.01
March	45.31
February	42.61
January	41.17
1922	
December	40.53
November	42.08
October	43.60
September	43.79
August	39.79
July	37.50
June	36.96
May	36.49
April	34.42
March	32.97
February	32.86
January	33.35
Average for year	37.86
1921	
December	33.99
November	34.71
October	35.46
September	35.34
August	35.99
July	38.14
June	41.87
May	43.32
April	43.84
March	45.37
February	48.81
January	51.98
Average for year	40.74
1920	
December	54.04
November	63.75
October	68.61
September	69.28
August	68.93
July	68.29
June	67.89
May	68.26
April	67.49
March	65.47
February	65.63
January	59.40
Average for year	65.59
1919	
December	54.88
November	51.28
October	48.76
September	48.35
August	48.27
July	47.86
June	47.88
May	48.29
April	48.45
March	52.28
February	53.71
January	53.81
Average for year	$50.32
1918	
December	57.24
November	55.67
October	57.53
September	56.56
August	56.6.
July	56.66
June	56.62
May	56.59
April	56.59
March	56.71
February	56.67
January	56.67
Average for year	56.68
1917	
December	56.68
November	58.29
October	67.75
September	83.18
August	89.69
July	89.56
June	82.66
May	73.96
April	66.48
March	61.07
February	56.76
January	55.10
Average for year	70.10
1916	
December	$53.68
November	46.77
October	41.50
September	39.97
August	39.67
July	38.37
June	39.63
May	39.78
April	39.13
March	37.18
February	35.63
January	33.66
Average for year	40.50
1915	
December	31.56
November	28.64
October	26.19
September	25.55
August	24.77
July	24.25
June	23.74
May	22.89
April	22.66
March	22.71
February	22.21
January	21.90
Average for year	24.76
1914	
December	$21.58
November	23.39
October	22.84
September	23.17
August	22.72
July	22.17
June	22.58
May	22.99
April	23.39
March	23.60
February	23.52
January	23.03
Average for year	22.92
1913	
December	23.29
November	24.02
October	24.91
September	25.55
August	25.97
July	26.34
June	26.78
May	27.34
April	27.74
March	27.93
February	28.05
January	27.96
Average for year	26.32

Madison street, plans the erection of a new plant.

DALLAS, TEX.—The Shook Rubber Co., 2500-2 South Ervay street, plans the erection of a 3-story building to cost about $40,000.

FT. WORTH, TEX.—The Gabert Automobile Works plans to rebuild the part of its plant recently damaged by fire.

WICHITA, FALLS, TEX.—The Moncrief & Lenoir Mfg. Co., Houston, Tex., is understood to be planning to establish a branch plant here for the manufacture of corrugated iron products, such as tanks, roofing, culverts, etc. E. E. Gilliland and B. F. Gilliland are owners of the company.

ABERDEEN, WASH.—The Grays Harbor Iron & Machine Works plans to rebuild the part of its plant recently damaged by fire.

SEATTLE, WASH.—The Young Iron Works has increased its capital stock from $20,000 to $100,000.

SEATTLE, WASH.—Contracts have been awarded for the construction of a machine shop, 60x120 feet, for the Robinson Gear & Machine Works.

SEATTLE—The Pacific Coast Chair Co., 1147 West Forty-seventh street, has awarded a contract for the erection of a plant building, 70 x 110 feet.

TACOMA, WASH.—The Washington Tool & Hardware Co. has taken possession of its new 3-story frame warehouse which was erected at an estimated cost of $25,000.

Business in Canada

KINGSTON, ONT.—The Canadian Non-Exhaust Pneumatic Machine Co., Ltd., has been incorporated with $750,000 capital stock by Frank S. Taylor, Albert E. Thomas and H. M. Brown.

OSHAWA, ONT.—General Motors Truck Co. of Canada, Ltd., has been incorporated with $10,000 capital stock by William S. Morlock, Sydney E. Wedd and Roy B. Whitehead.

OSHAWA, ONT.—Bull-Durant, Ltd., has been incorporated to manufacture shock absorbers with $75,000 capital stock by Frank W. Bull, William O. Durant, Frank G. James and others.

TORONTO, ONT.—The Williams Sealing Corp. has been incorporated to carry on a general machine shop business with $40,000 capital stock by John N. Black and others.

TORONTO, ONT.—The Durable Electric Appliance Co., Ltd., has been incorporated with $60,000 capital stock by William E. B. McLaughlin, Laura Clark and Walter Clark.

TORONTO, ONT.—The Shierk Bumper Co., Ltd., has been incorporated to manufacure air compressors, electric machines and apparatus, with $250,000 capital stock by John F. Lennox, Arthur J. Trebilcock, E. Frisby and others.

TORONTO, ONT.—The Stromberg-Carlson Telephone Mfg. Co. of Canada, Ltd., has been incorporated with $100,000 capital stock by Henry H. Davis, John R. Rumbull and Edward H. Brower.

TORONTO, ONT.—J. G. Tickell & Sons have taken over the bronze foundry and art metal department of the Canadian Wm. A. Rogers, Ltd., here and are operating as a separate business.

TORONTO, ONT.—The Lincoln Rubber Products, Ltd., has been incorporated to manufacture rubber goods with $600,000 capital stock by Joseph Roebuck, Leonard Bennett and Thelma McNichol.

TORONTO, ONT.—The Zenith Oil Heaters (Ontario), Ltd., has been incorporated to manufacture and deal in oil heaters, motors, engines, machinery, etc., with $100,000 capital stock; by Harry C. Moore, Robert E. Duffy, Walter A. McConnell and others.

TORONTO, ONT.—The Winter Joyner Co., Ltd., has been incorporated to manufacture and deal in electrical machinery, mechanical appliances, tools, etc., with $40,000 capital stock; by John I. Sutcliffe, Hartar Singh, Albert H. Winter and others.

TORONTO, ONT.—The Pilot Mfg. Co., Ltd., has been incorporated to manufacture milking machines, agricultural implements, machinery, tools, etc., with $2,000,000 capital stock; by John M. Macintosh, Charles H. Walker, Harry A. Hutson and others as provisional directors.

WINDSOR, ONT.—The lumber mill owned by the Haugh Lumber Co. was damaged by fire May 14 with a loss of $30,000.

WINDSOR, ONT.—Howitt Battery & Electric Service Co., Ltd., has been incorporated with $40,000 capital stock by Ralph C. McMillen, Christopher H. Langwith and H. L. Barnes.

WINDSOR, Ont.—The Considine Reid Construction Co. has been awarded a contract by the Canadian Pacific Railway for re-modeling the slip-docks at the foot of Crawford avenue, at an estimated cost of $60,000.

WINDSOR, ONT.—The Emergency Auto Seat & Body Co., Ltd., has been incorporated to manufacture automobile bodies, etc., with $50,000 capital stock by James E. Lawson, John E. Corcoran and David C. Howard.

WINDSOR, ONT.—The Western Motor Corp., Ltd., has been incorporated to manufacture and deal in automobiles, trucks, motors, engines, etc., with $100,000 capital stock; by Frederick J. Fairhall, Loyal S. Bussy, Arthur G. Tierney and others.

MONTREAL, QUE.—The Montreal Island Power Co. has been incorporated with $1,375,000 capital stock. The company is preparing to build a dam and power development plant on the Back river on Montreal island, to develop approximately 45,000 horsepower.

SILLERY, QUE.—The Quebec Pulp & Paper Co., Ltd., recently organized, will build a pulp mill with a daily capacity of 100 tons.

UPPER BEDFORD, QUE.—The Terrington Co. will build an addition to its plant here and install equipment for the manufacture of latch knitting machine needles.

This is the Mark of the NEW METAL

Specially Prepared for VITREOUS ENAMELING

for Such Purposes as

Stove Door Panels; Splasher Backs; Broiler Pans; Table Tops; Refrigerators; Signs; and other flat work. Like all other Mansfield Products, WABIK METAL SHEETS are rolled from our own special "BOTTOM-POURED" INGOTS.

Mansfield Sheet and Tin Plate Co.
Mansfield **Ohio**

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	18.50 to 19.00
Boston (dealers)	14.50 to 15.00
Buffalo	20.00 to 20.50
Chicago	18.50 to 19.00
Cleveland	22.25 to 22.50
Cincinnati	19.00 to 19.50
Detroit (dealers)	18.00 to 18.50
Eastern Pennsylvania	19.00 to 20.00
New York (dealers)	16.00 to 16.50
Pittsburgh	21.50 to 22.00
St. Louis	18.00 to 18.50
Valleys (nominal)	22.50 to 23.00
No railroad steel New York (dealers)	16.00 to 16.50

BUNDLED SHEETS

Buffalo	$16.25 to 16.75
Cleveland	13.00 to 13.25
Cincinnati	15.50 to 16.00
Detroit	14.50 to 15.00
Eastern Pennsylvania	17.00 to 18.00
Pittsburgh	18.00 to 18.50
St. Louis	14.00 to 14.50
Valleys	17.50 to 18.00

STEEL RAILS, SHORT

Birmingham	$19.00 to 20.00
Boston (dealers)	14.50 to 15.00
Chicago	22.00 to 22.50
Cincinnati	24.00 to 24.50
Cleveland	21.00 to 21.50
St. Louis	21.50 to 22.00

STOVE PLATE

Birmingham	18.50 to 20.00
Boston	19.00 to 19.50
Buffalo	20.00 to 21.00
Chicago	18.00 to 18.50
Cincinnati (net tons)	13.50 to 14.00
Cleveland	21.00 to 21.50
Detroit (net ton) (dealers)	16.50 to 17.00
Eastern Pennsylvania	18.00 to 19.00
New York (dealers)	15.50 to 16.00
Pittsburgh	17.00 to 17.50
St. Louis	18.50 to 19.00

LOW PHOSPHORUS

Buffalo	26.00 to 27.00
Cincinnati	19.50 to 20.50
Eastern Pennsylvania	27.00 to 28.00
Pitts. billets and bloom crops	25.00 to 25.50

SHOVELING STEEL

Chicago	18.25 to 18.75
Pittsburgh	18.00 to 18.50
St. Louis	18.00 to 18.50

KNUCKLES, COUPLERS & SPRINGS

Chicago	24.00 to 24.50
Eastern Pennsylvania	24.00 to 25.00
Pittsburgh	24.00 to 24.50
St. Louis	24.00 to 24.50

COMPRESSED SHEETS

Buffalo	19.50 to 20.50
Chicago	17.50 to 18.00
Pittsburgh	20.00 to 21.50
Cleveland	20.75 to 21.25
Detroit (dealers)	19.00 to 19.50
Valleys (nominal)	22.00 to 22.50

FROGS, SWITCHES, GUARDS

Chicago	19.00 to 19.50
Eastern Pennsylvania	19.00 to 20.00
St. Louis	19.00 to 19.50

BOILER PLATE, CUT

St. Louis (dealers)	14.00 to 14.50

ANGLE BARS—STEEL

Chicago	22.00 to 22.50
St. Louis	20.00 to 20.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	19.00 to 20.00
Boston (dealers)	17.00 to 18.00
Buffalo	20.00 to 21.00
Chicago, No. 1	18.50 to 19.00
Chicago, No. 2	18.50 to 19.00
Cincinnati No. 1	17.00 to 17.50
Eastern Pennsylvania, No. 1	23.00 to 24.00
Pittsburgh, No. 1	21.00 to 21.50
Pittsburgh No. 2	21.50 to 22.00
New York, No. 1 (dealers)	20.75 to 21.25
St. Louis, No. 1	18.50 to 19.00
St. Louis, No. 2	18.00 to 18.50

WROUGHT PIPE

Boston (dealers)	12.00 to 12.50
Buffalo	17.00 to 18.00
Eastern Pennsylvania	15.00 to 16.00
New York (dealers)	12.50 to 13.00

YARD WROUGHT

Boston	16.00 to 17.00
Eastern Pennsylvania	20.00 to 21.00

CITY WROUGHT

New York, long	$18.00 to 18.50

BUSHELING

Buffalo, No. 1	19.00 to 20.00
Chicago, No. 1	18.50 to 19.00
Chicago, No. 2	14.00 to 14.50
Cincinnati No. 1	15.50 to 16.00
Cleveland, No. 1	17.00 to 17.25
Cleveland, No. 2	15.00 to 15.50
Detroit, No. 1	16.00 to 16.50
Detroit No. 2 (new)	14.00 to 15.00
Detroit, No. 2 (old)	13.00 to 14.00
Eastern Pennsylvania	21.00 to 22.00
Pittsburgh, No. 1	17.00 to 17.50
St. Louis, No. 1	18.00 to 18.50

MACHINE SHOP TURNINGS

Birmingham	12.00 to 13.00
Boston (dealers)	13.50 to 14.00
Buffalo	17.50 to 18.00
Chicago	13.50 to 14.00
Cleveland	17.25 to 17.50
Cincinnati (net ton)	13.00 to 13.50
Detroit (dealers)	13.50 to 14.00
Eastern Pennsylvania	17.00 to 18.00
New York (dealers)	15.25 to 15.75
Pittsburgh, No. 1	18.00 to 18.50
St. Louis	14.00 to 14.50
Valleys	17.00 to 17.50

CAST IRON BORINGS

Birmingham (chemical)	18.00 to 20.00
Birmingham borings (plain)	12.00 to 13.00
Boston (chemical)	16.00 to 17.00
Boston (dealers)	14.00 to 14.50
Buffalo	19.00 to 20.00
Chicago	16.00 to 16.50
Cincinnati (net tons)	14.00 to 14.50
Cleveland	17.50 to 17.75
Detroit (dealers)	14.50 to 15.00
Eastern Pennsylvania	17.50 to 18.00
Eastern Pennsylvania (chem.)	21.00 to 22.00
Pittsburgh	18.00 to 18.50
New York (dealers' price)	15.25 to 15.75
St. Louis	15.50 to 16.00
Valleys	19.50 to 19.75

MIXED BORINGS AND TURNINGS
(For blast furnace use)

Boston (dealers)	14.00 to 14.50
Cleveland	17.25 to 17.50
Detroit (dealers)	14.50 to 15.00
Eastern Pennsylvania	17.00 to 18.00
New York (dealers)	14.00 to 14.50

IRON AXLES

Birmingham	28.00 to 30.00
Boston (consumers)	31.00 to 32.00
Buffalo	30.00 to 31.00
Chicago	32.00 to 32.50
Cincinnati	28.00 to 29.00
Eastern Pennsylvania	nominal
New York (dealers)	30.00 to 40.00
St. Louis	30.00 to 30.50

IRON RAILS

Buffalo	$23.00 to 23.50
Chicago	23.00 to 23.50
Cincinnati	17.50 to 18.00
St. Louis	20.00 to 20.50

PIPES AND FLUES

Chicago	14.50 to 15.00
Cincinnati	13.50 to 14.00
Cleveland	16.00 to 16.50
St. Louis	14.00 to 14.50

RAILROAD GRATE BARS

Buffalo	18.00 to 19.00
Chicago	18.00 to 18.50
Cleveland	21.00 to 21.50
Eastern Pennsylvania	19.00 to 20.00
New York (dealers)	17.00 to 17.50
St. Louis	18.00 to 18.50

FORGE FLASHINGS

Boston (dealers)	13.50 to 14.00
Chicago, small	17.00 to 17.50
Cleveland, small	19.50 to 19.75
Cleveland, large	19.50 to 19.75
Detroit (dealers)	14.50 to 15.00

FORGE SCRAP

Boston (dealers)	13.50 to 14.00
Chicago	19.00 to 19.50
Eastern Pennsylvania	18.50 to 19.50

ARCH BARS AND TRANSOMS

Chicago	26.50 to 27.00
St. Louis	26.00 to 26.50

ANGLE BARS—IRON

Chicago	26.00 to 26.50
St. Louis	25.50 to 26.00

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	15.00 to 15.50
Buffalo	22.50 to 23.00
Chicago	18.00 to 18.50
Cleveland	19.00 to 19.25
Eastern Pennsylvania	19.00 to 20.00
Pittsburgh	19.00 to 19.50
St. Louis	16.00 to 16.50

STEEL CAR AXLES

Birmingham (dealers)	25.00 to 26.00
Boston (consumers)	24.00 to 25.00
Buffalo	24.50 to 25.50
Chicago	25.25 to 25.75
Cleveland	30.00 to 31.00
Eastern Pennsylvania	nominal
New York (dealers)	22.00 to 23.00
Pittsburgh	25.00 to 25.50
St. Louis	24.00 to 24.50

SHAFTING

Boston (consumers)	24.50 to 25.00
Chicago	25.25 to 25.75
Eastern Pennsylvania	24.00 to 26.00
New York (dealers)	21.00 to 21.50
St. Louis	24.00 to 24.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram car	22.00 to 23.00
Birmingham, iron	23.00 to 24.50
Boston (consumers)	26.00 to 27.00
Buffalo, iron	21.00 to 22.00
Chicago, iron	23.50 to 24.00
Cincinnati	18.50 to 19.00
Eastern Pennsylvania	23.00 to 25.00
New York iron (dealers)	22.50 to 23.50
Pittsburgh, iron	22.00 to 22.50
Pittsburgh, steel	24.00 to 24.50
St. Louis, iron	22.50 to 23.00

NO. 1 CAST SCRAP

Birmingham, cupola	24.00 to 25.00
Boston (consumers)	24.75 to 25.25
Buffalo	23.00 to 24.00
Chicago, cupola	23.00 to 23.50
Cincinnati, No. 1, machinery, cupola (net tons)	23.50 to 24.00
Cleveland, cupola	27.00 to 28.00
Detroit (net ton) (dealers)	22.00 to 22.50
Eastern Pennsylvania, cupola	23.00 to 25.00
New York, cupola (dealers)	24.00 to 26.00
Pittsburgh, cupola	24.00 to 24.50
San Francisco	26.00 to 28.00
St. Louis, agricultural	23.00 to 23.50
St. Louis, railroad	23.00 to 23.50
Valleys	27.00 to 27.50

HEAVY CAST

Boston (consumers)	23.00 to 24.00
Buffalo	18.00 to 19.00
Cleveland	20.00 to 20.50
Detroit (automobile (net ton)	25.00 to 26.00
Eastern Pennsylvania	19.50 to 20.50
New York (dealers)	20.00 to 21.00
Pittsburgh	20.00 to 20.50

MALLEABLE

Boston (railroad) (consumers)	26.00 to 27.00
Buffalo	24.00 to 25.00
Chicago, railroad	25.00 to 25.50
Chicago, agricultural	23.50 to 24.00
Cincinnati, agricultural	19.50 to 20.50
Cincinnati, railroad	21.50 to 22.00
Cleveland, agricultural	27.00 to 28.00
Cleveland, railroad, nominal	28.50 to 29.00
Detroit (dealers)	23.00 to 24.00
Eastern Pennsylvania, railroad	22.00 to 23.00
Pittsburgh, railroad	24.00 to 24.50
St. Louis, agricultural	22.00 to 22.50
St. Louis, railroad	22.50 to 23.00

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	20.00 to 21.00
Boston (dealers)	18.00 to 18.50
Chicago	21.00 to 21.50
Cleveland	24.00 to 24.50
Eastern Pennsylvania	22.00 to 23.00
New York (dealers)	20.00 to 20.50
Pittsburgh district	23.00 to 23.50
St. Louis	20.00 to 20.50

LOCOMOTIVE TIRES

Chicago	20.75 to 21.25
St. Louis	20.00 to 20.50

LOW PHOSPHORUS PUNCHINGS

Chicago	21.00 to 21.50
Eastern Pennsylvania	26.00 to 28.00
Pittsburgh	25.00 to 25.50